Vol. 990 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 1, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

January 1, 1980 Volume 990 Number 1

CONTENTS

	Page
Consolidated Listing of Recent Official Gazette Notices Re Patent and Trademark Office Practices and Procedures	990 OG 3
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	990 OG 157
Examination	990 OG 157
National Inventors' Day	990 OG 157
Reissue Applications Filed	990 OG 157
Patent Notices	
Certificates of Correction for the Week of January 1, 1980	990 OG 159
Disclaimers	990 OG 159
Patents Available for Licensing or Sale	990 OG 159
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	990 OG 161
Condition of Patent Applications	990 OG 162
Defensive Publications	1
Patents Granted	
General and Mechanical (4,180,867)	3
Chemical (4,181,497)	217
Electrical (4,181,812)	309
Design Patents Granted (253,796)	369
Index of Patentees	PI 1
Indices of Applicants of Defensive Publications and Designs	PI 37
Classification of	
Patents	PI 39
Designs and Defensive Publications	PI 41
Geographical Index of Residence of Inventors	
Patents	PI 42
Designs and Applicants of Defensive Publications	PI 43
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

CONSOLIDATED LISTING OF RECENT OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the OFFICIAL GAZETTE *from July 1, 1964, through December 31, 1979. These notices and rule changes are currently in effect unless otherwise noted.*

CONTENTS

	Items
Information and Correspondence	1–19.1
Records and Files	20–24
Fees and Payment of Money	25–29
Application Content	30–36
Examination of Applications	37–64
Miscellaneous	65–74
Patent Cooperation Treaty	75–80
Trademarks	81–101

Index (Page 155)

INFORMATION AND CORRESPONDENCE

(1) OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) GROUP NUMBER SHOULD APPEAR ON COMMUNICATIONS RELATING TO PENDING APPLICATIONS

It is again requested that the Group number be typed on amendments and other communications relating to pending applications in order to expedite the handling of mail and to conserve manpower. The number of the Group should be placed on the right-hand side, opposite the Serial Number or name of applicant. In view of the vast amount of mail, continued careful attention to these details will do much toward avoiding delay in handling of mail.

C. A. KALK,
Nov. 6, 1969. *Director of Administration.*

[869 O.G. 345]

(3) IDENTIFICATION FOR APPLICATION CORRESPONDENCE

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on the Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL–85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

(4) IDENTIFYING APPLICATION CORRESPONDENCE WITH ISSUE BATCH NUMBER

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue

Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

(5) HAND DELIVERY OF PAPERS

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

(6) POST CARD RECEIPT REMINDER

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

(7) STATUS INQUIRIES

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the OFFICIAL GAZETTE are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment' date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response

to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

---

(8) CHANGE OF ADDRESS

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
May 28, 1975.

[935 O.G. 1352]

---

(9) CHANGE OF ADDRESS OR PRACTITIONER IN A PLURALITY OF PATENT APPLICATIONS

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

---

(10) EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
May 15, 1975.

[936 O.G. 1554]

---

(11) CERTIFICATE OF MAILING PROCEDURES

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the OFFICIAL GAZETTE on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the OFFICIAL GAZETTE on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order

to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the OFFICIAL GAZETTE (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

> I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------.
>
> (Date of Deposit)
>
> ---
>
> Name of applicant, assignee, or Registered Representative
>
> ---
>
> Signature
>
> ---
>
> Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certificate of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patent and Trademarks.*

[962 O.G. 20]

(12) CHANGE IN LEGAL HOLIDAYS

The Commissioner's Notice of December 2, 1970, "Change in Legal Holidays" is hereby rescinded, in view of Public Law 94–97, September 18, 1975, 89 Stat. 479, which amended the listing of legal public holidays in 5 USC § 6103 by changing the Veterans Day holiday from the fourth Monday in October to November 11 of each year. Section 6103, as amended, reads as follows:

(a) The following are legal public holidays:
New Years Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, November 11.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

Attention is called to the fact that the above listing of holidays in 5 USC § 6103, as amended, should be followed, rather than the listing appearing on page 69 of the June 1979 Patent Laws pamphlet which does not reflect the noted amendment.

LUTRELLE F. PARKER,
Date: Sept. 25, 1979. *Acting Commissioner, U.S. Patent and Trademark Office.*

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

[987 O.G. 30]

---

(13) ACCEPTABLE DRAWINGS FOR PATENTS

Approximately ten years ago, the Office's standards for acceptable drawings with respect to certain matters including the blackness and minimum thickness of inked lines, and shading of drawings, were relaxed in order to reduce the backlog of informal drawings at that time.

Apparently, because of the increased use of pens with a round, open-end capillary tip in place of the conventional draftsman's drawing pen, the Office now has a problem of obtaining acceptable reproduction copies of thin, light and gray lines which appear on many drawings. As a result, approximately 10,000 drawings sheets filed each year are *not* acceptable for normal reproduction and microfilming from the printed copy. Special printing steps must be taken to try to print very thin or light lines. Inked lines should be at least 0.012 inch in width and no closer together than 0.05 inch. Shading lines should be constructed to meet these criteria for acceptable drawings. The inked lines must not rub off the standard bristol board sheet, and their reflectance should not exceed 12%.

Applicants and draftsmen are requested not to use thin or light lines on their drawings. In the future, drawing requirements will be more stringent regarding the blackness and minimum thickness of lines to be acceptable. The Chief Draftsman has been instructed to adhere strictly to the above standards and criteria after January 1, 1978 so that special printing requirements can be held to a minimum.

Persons interested in examples of acceptable and unacceptable lines for drawings may obtain one set of "Printed Examples from Unacceptably Inked Drawings" by writing to:

The Chief Draftsman
U.S. Patent and Trademark Office
Washington, D.C. 20231

RICHARD J. SHAKMAN,
Oct. 20, 1977. *Assistant Commissioner for Administration.*

[964 O.G. 21]

---

(14) REGULATIONS FOR THE USE OF THE FACILITIES OF THE PATENT AND TRADEMARK OFFICE

Revision of Regulations

AGENCY: Patent and Trademark Office, Commerce.
ACTION: Notice.

SUMMARY: The Patent and Trademark Office gives notice of a revision of its "Regulations for the Public Use of Records in the Public Search Room for Patents of the Patent and

Trademark Office," published in the Federal Register of July 14, 1976, 41 FR 29009. The regulations published in the Federal Recister of July 14, 1976, are limited to the use of the Public Search Room for Patents. The revision is intended to allow public use of other Patent and Trademark Office record facilities with minimum risk to the security of Patent and Trademark Office personnel and government property.

EFFECTIVE DATE: June 26, 1979.

FOR FURTHER INFORMATION CONTACT: Bradford R. Huther, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, 703–557–2290.

SUPPLEMENTARY INFORMATION: This revision is an extension of the present regulations, published in the Federal Register of July 14, 1976, 41 FR 29009, to allow public use of Patent Examining Group Facilities and the Scientific Library under conditions which are as nearly as possible the same as those which apply to the Public Search Room for Patents.

All persons seeking use of the Public Search Room for Patents and/or the Patent Examining Group Facilities must obtain a User Pass. The guards at the entrances to the Public Search Room for Patents can direct prospective users to the pass issuance desk. User Passes will be issued to persons not under prohibition from using the facilities who agree to abide by the regulations of the Public Search Room for Patents and the Patent Examining Group Facilities.

The use of the Group facilities for search purposes by members of the public is strictly limited to the search of materials not available in the Public Search Room for Patents or the Scientific Library and when it does not conflict with the regular business of Patent and Trademark personnel and only between the hours of 8:45 a.m. and 4:45 p.m. on regular business days.

The Public Search Room for Patents is open 8:00 a.m.–8:00 p.m., Monday through Friday except on legal holidays. The hours of the Record Room are 8:00 a.m.–5:00 p.m. on the days the Public Search Room for Patents is open.

The revised regulations appear below:

REGULATIONS

Regulations for members of the public using the facilities of the U.S. Patent and Trademark Office, including but not limited to the Public Search Room for Patents.

The Public Search Room for Patents is defined as that area comprising the foyers of the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices; Microfilm Center; restrooms and telephone areas off these foyers; the stacks; Record Room public reception area; study and copier areas between the foyers; and the Mezzanine.

The facilities of the Patent Examining Groups are defined as those areas in Buildings 3, 34 and 4 of Crystal Plaza designating Examining Groups.

With the respect to the Group Facilities, authorized personnel under these Regulations, include Supervisory Patent Examiners and Examining Group Directors.

The Scientific Library is located on the second floor of Building 34 of Crystal Plaza.

To maintain and protect the patents and related records located in the Public Search Room for Patents and the Patent Examining Group Facilities, it is necessary to establish and to enforce certain rules and regulations pertaining to the use thereof. Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR Subpart 101–20.3; and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Patent and Trademark Office.

These regulations supersede all previous regulations on the subject.

1. All persons using the facilities of the Patent and Trademark Office are subject to the regulations governing conduct on property under the charge and control of the General Services Administration which appear in 41 CFR Subpart 101–20.3 [41 CFR §§ 101–20.300 through 101–20.314].
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. No food or beverages in any form are to be consumed except in designated areas.
5. Loud talking, use of radios, and any other form of activity which may disturb other members of the public and/or Patent and Trademark Office personnel are forbidden.
6. Children brought into the Patent and Trademark Office must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patent records and any other property of the Patent and Trademark Office shall not be removed from their normal location without permission from an authorized official; nor shall such records or property be mutilated. Authorization will not be given to remove from any Group Facility, U.S. patents or any other material readily available through the Scientific Library.
10. The use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission from an authorized official. Relative to the Public Search Room, the use of dictation equipment is prohibited except in designated areas. Whenever permission is obtained, the use of such equipment must not conflict with Regulation 5.
11. In the Public Search Room for Patents, library trucks or carts are to be used for transporting bundles only. The trucks or carts are not to be used for storage while making searches.
12. In the Public Search Room for Patents, patents temporarily removed from bundles for any purpose must be returned to the proper place in the appropriate bundle.
13. In the Public Search Room for Patents, all bundles of patents must be promptly and properly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Public Search Room for Patents after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be worn and visible at all times when Patent and Trademark Office facilities are being used. In addition, all persons holding User Passes must register with the designated representative in each Examining Group where they search and must sign a log (sign-in, sign-out sheet) indicating time-in, time-out, name, User Pass number, class(es) and subclass(es) users after 6:00 p.m.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark personnel upon request for cause.
19. Packages, briefcases or other personal effects brought into the Public Search Room for Patents or the Group Facilities are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All packages, briefcases or other personal effects brought into the Group Search Rooms must be removed when leaving the Group Search Room areas.
21. Patents and other documents must not be removed from the Group patent shoes for any reason other than for cursory study thereof while kept in close proximity with the shoe and must not be moved out of their normal sequence.
22. All patent shoes must be promptly replaced in their proper location in the shoe cases.
23. All textbooks, journals and the like must be returned to their proper location.
24. All persons using the facilities of the Patent and Trademark Office are to refrain from engaging in any conduct which (1) is criminal in nature or (2) which causes or appears to cause an employee of the Patent and Trademark Office to violate the conflicts of in-

terest regulations of the Department of Commerce [15 CFR §§ 0.735–1 through 0.735–41].

25. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents and the Group Facilities, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

These regulations will be enforced in accordance with the Procedures for Enforcement published in the Federal Register of May 17, 1978, 43 FR 21345 (970 O.G. 114, published May 30, 1978).

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents and the Patent Examining Group Facilities and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

These Regulations have been instituted in order to maintain high quality and completeness of patent files and to provide an orderly environment for exploring, or studying in depth, the wealth of scientific and technological information contained in United States Patents. Although the Regulations may cause some inconvenience, the understanding and cooperation of users will insure that, for future users, the knowledge contained in United States Patents will be available in an environment conducive to study in the Public Search Room for Patents and the Patent Examining Group Facilities.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

June 20, 1979.

[984 O.G. 26]

---

(15) Regulations Relating to the Use of Patent and Trademark Office Records Facilities

Establishment of Enforcement Procedures

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: The Patent and Trademark Office is adopting procedures for enforcing existing regulations governing the use of the Public Search Room for Patents and the Patent Examining Group Search Facilities by members of the public. Enforcement of the existing regulations is necessary, and is intended by these procedures, to carry out the commitment of the Office to the public to promote an atmosphere conducive to research and maintain the integrity of the files in the Public Search Room for Patents and in the Examining Group Search Facilities.

EFFECTIVE DATE: 6–30–78.

FOR FURTHER INFORMATION CONTACT: Bradford R. Hunter, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557–2290.

SUPPLEMENTARY INFORMATION: The procedures will apply in enforcing the regulations for the public use of records of the Public Search Room for Patents and the Patent Examining Group Search Facilities. The regulations of the Public Search Room for Patents were published in the Federal Register for July 14, 1976, 41 F.R. 29009, and incorporated in a Search Room User Agreement entered into by each person who is issued a User Pass. Regulations for Users of the Patent Examining Group Search Facilities were established under Rule 2 of the regulations of the Public Search Room for Patents and were published in the OFFICIAL GAZETTE of March 22, 1977, 956 O.G. 1118. The procedures appear below.

PROCEDURES FOR ENFORCEMENT OF THE REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS AND THE PATENT EXAMINING GROUP SEARCH FACILITIES

Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR 101–20.3; and appropriate sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the procedures appearing below are established.

VIOLATION INVOLVING THE SECURITY SYSTEM

1. *Unauthorized removal of government property.*

(a) The Public Search Room for Patents is equipped with a security system designed to sound an alarm when an attempt to remove government property from the Public Search Room is detected. Each alarm signal triggered by a person passing through an exit to the Public Search Room will be investigated by security guards stationed at the Public Search Room exits. The person involved will be required to stop and allow the security guards to determine the cause of the alarm. If non-government property is the cause for the alarm, the person will be allowed to proceed without further delay. If unauthorized possession of government property is found to be the cause of the alarm, the person in whose possession the property is found will be advised that a violation has occurred and will be required to surrender the property to the Manager of the Public Search Room. An oral explanation for the possession of such property will be requested by the Manager.

(b) The Manager of the Public Search Room will immediately report each incident involving unauthorized possession of government property to the Deputy Assistant Commissioner for Administration by telephone, and if requested submit a written report, together with the government property and User Pass involved to the Deputy Assistant Commissioner for Administration.

(3) If it shall appear to the Deputy Assistant Commissioner for Administration that unauthorized possession of government property, detected by the security system, was inadvertent or otherwise unintentional, no further action will be taken. Otherwise, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

OTHER VIOLATIONS OF THE PUBLIC SEARCH ROOM REGULATIONS

2. *All other violations of the Public Search Room Regulations.*

(a) Each observed or reported violation will be investigated by the Manager of the Public Search Room. If a violation has occurred and is not denied, the person involved will be verbally requested by the Manager to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request of the Manager to comply with the regulations, or violates the regulations after having agreed to comply with them, the person will be required to surrender his or her User Pass to the Manager of the Public Search Room.

(b) The Manager of the Public Search Room will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Administration.

(c) If the Deputy Assistant Commissioner for Administration is satisfied that a reported violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

VIOLATIONS OF THE PATENT EXAMINING GROUP SEARCH FACILITIES REGULATIONS

3. *Violations of the Regulations for Users of the Patent Examining Group Search Facilities.*

(a) Each observed or reported violation will be investigated by Authorized Official. If a violation has occurred, and is not denied, the person involved will be verbally requested to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request to comply with regulations, or violates the regulations after having agreed to comply with them, the person involved will be required to surrender his or her User Pass to the Authorized Official.

(b) The Authorized Official will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Patents.

(c) If the Deputy Assistant Commissioner for Patents is satisfied that violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Patents will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked. A written decision will be rendered by the Deputy Assistant Commissioner for Patents after consideration of any timely submitted response.

PENALTIES

4. *Factors to be Considered in Assessing Penalties.*

(a) Penalties will be determined on a case-by-case basis. A record of penalties imposed for given violations will be kept and made available to the public upon request.

(b) Due weight may be given to prior violations of the regulations in assessing whether any given violation is willful, deliberate or intentional.

(c) Prior violations of the regulations will be considered in determining any specific penalty to be imposed. Depending upon the circumstances, the penalty for a first offense may range from an oral or written warning to a 60-day suspension of the User Pass. For a second offense, the penalty may be a suspension of from 5 days to 1 year. For a third offense, the penalty may range from a 30-day suspension to revocation of the User Pass.

GENERAL PROVISIONS

5. *Use of Search Facilities During Suspension or After Revocation of User Pass.*

No individual will be permitted to use the Public Search Room for Patents or the Patent Examining Group Search Facilities while his or her User Pass is suspended or revoked.

6. *Temporary User Pass.*

Any person whose User Pass was surrendered, but not suspended or revoked, may be issued a temporary User Pass which shall be valid until the User Pass is returned or a decision is rendered pursuant to paragraph 1(c), 2(c), 3(c).

7. *Absence of the Deputy Assistant Commissioner for Administration.*

In the absence of the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services will carry out the functions and responsibilities assigned to the Deputy Assistant Commissioner for Administration in paragraph 1(b) and (c) and 2(b) and (c).

8. *Absence of the Manager of the Public Search Room.*

In the absence of the Manager of the Public Search Room, the Acting Manager will carry out the duties and responsibilities assigned to the Manager in paragraphs 1(a), 1(b), 2(a) and 2(b).

9. *Assistance.*

The Manager of the Public Search Room and the Authorized Official may, when necessary request the Security Officer of the Patent and Trademark Office or the GSA to provide assistance in carrying out their functions in paragraphs 1(a), 2(a), and 3(a).

10. *Petitions.*

A decision rendered by the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services, or the Deputy Assistant Commissioner for Patents may be reviewed on petition to the Commissioner.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 5, 1978.

[970 O.G. 114]

---

(16) USE OF CERTIFICATE OF CORRECTION FORMS

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on the Certificate of Correction form, PTO–1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of Form PTO–1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.

The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.

Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.

Copies of form PTO–1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

May 10, 1977.

[959 O.G. 3]

---

(17) GOVERNMENT PUBLICATION SUBSCRIPTION SERVICE

The purpose of this notice is to inform subscribers of Federal Government publications serviced by the Government Printing Office, Superintendent of Documents, of the requirement to standardize subscriber change of address procedures.

It is imperative that the Government Printing Office be advised by each subscriber of an address change and that such advisement be accompanied by the latest subscription address label.

The Government Printing Office has the largest number of subscriptions of any activity in the United States, The Superintendent of Documents maintains about 835 mailing lists containing nearly 3 million addresses. Many of these subscribers frequently change their addresses and inform the Superintendent of Documents in a wide variety of methods. Some large organizations have as many as 20 identical subscriptions to the same street address but with different internal deliveries. Altogether the Government Printing Office is mailing nearly 5 million subscription copies each month. The Government Printing Office requests your cooperation to more effectively maintain the many mailing lists.

For your convenience, a change of address form is reproduced on the last page of the OFFICIAL GAZETTE.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 9, 1977.

[962 O.G. 2]

---

(18) NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE, MPEP Revisions, Trademark Rules of Practice, Annual Indices, and all other patent and trademark publications.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

All correspondence and inquiries concerning subscription services to patent and trademark related publications, and requests for reinstatement of subscriptions should be directed to:

Mr. C. A. LaBarre
Asst. Public Printer
Superintendent of Documents (SD)
Government Printing Office
Washington, D.C. 20401

This notice is effective with the publication date and supersedes the notice published on this subject in 939 O.G. 1, dated October 7, 1975.

RICHARD J. SHAKMAN,
Mar. 14, 1978. *Assistant Commissioner for Administration.*

[969 O.G. 2]

---

(19) LOOSELEAF RULES OF PRACTICE IN PATENT AND TRADEMARK CASES

The Patent and Trademark Office has received a large number of inquiries about and suggestions for the publication of the Rules of Practice in Patent and Trademark Cases in looseleaf form again. The Office has been informed that such a publication of the patent and trademark Rules is available in a sturdy binder from:

Rules Service Company
Suite 301
3930 Knowles Avenue
Kensington, Maryland 20795
(301) 949-1090

The Rules Service Company indicates that each subscription includes a text of the rules that is up-to-date when sent, and all changes to that text that occur for the next twelve months, after which the subscription may be renewed. The cost of an initial subscription is $25.00, which should accompany the order.

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, which is reprinted annually.

RENE D. TEGTMEYER,
Oct. 13, 1978. *Assistant Commissioner for Patents.*

[976 O.G. 2]

(19.1) FLEXIBLE WORKING HOURS

On January 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:00 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

DONALD W. BANNER,
Dec. 13, 1978. *Commissioner of Patents and Trademarks.*

[978 O.G. 140]

RECORDS AND FILES

(20) ASSIGNEE NAMES

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL-85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL-85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[942 O.G. 186]

---

(21) SUBMISSION OF UNIFORM ASSIGNEE NAMES ON THE ISSUE FEE PAYMENT FORM PTOL-85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL-85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL-85b should ensure that the same company name form is used for all patents issuing to a particular company.

RICHARD J. SHAKMAN,
Nov. 17, 1977. *Assistant Commissioner for Administration.*

[965 O.G. 8]

---

(22) TITLE OF INVENTION CARRIED ON OFFICE RECORDS

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.
Aug. 31, 1977.

[962 O.G. 23]

---

(23) REVISED PATENT APPLICATION FILING RECEIPT

As a part of the new automated patent application information system, a revised Filing Receipt will be put into use in June 1979. The major modification is a change in size from the current 3 x 5 inch size to a larger 8½ x 11 inch size. It should be noted that this change is consonant with the recently announced, government-wide policy to use 8½ x 11 inch paper.

The same information currently appearing on the Filing Receipt form will be retained on the revised form. In addition, all information supplied by applicant relating to prior domestic, foreign and PCT international applications will be printed on the Receipt. Applicants are requested to verify all of the data printed on the Receipt and notify the Patent and Trademark Office of any errors. Such notification should be directed to the attention of the Application Division.

RICHARD J. SHAKMAN,
May 14, 1979. *Assistant Commissioner for Administration.*

[983 O.G. 2]

(24) NEW SECURITY PROCEDURE

A Security Task Force, which was established in mid-1978, submitted a number of recommendations for improvements in the security of Patent and Trademark Office personnel and government property.

One recommendation that we adopted requires that either an employee building pass, user pass, or visitor pass be worn by each person in the Patent and Trademark Office in a manner so as to be visible at all times when the person is using Patent and Trademark Office facilities. This procedure will permit immediate visual recognition of all persons authorized to use our facilities. User and visitor passes may be obtained from the Receptionist, Public Search Room, Crystal Plaza Building 3, Room 1A03.

Effective upon publication of this notice, all persons will be required to comply with this procedure. Failure to do so may result in denial of the use of our facilities.

DONALD W. BANNER,
June 4, 1979. *Commissioner of Patents and Trademarks.*

[983 O.G. 25]

FEES AND PAYMENT OF MONEY

(25) FEES IN CONNECTION WITH AMENDMENTS TO PATENT APPLICATIONS

This notice supplements the Notice of September 10, 1965, 818 O.G. 1207, September 28, 1965, relating to the administration of the act of July 24, 1965, Public Law 89–83, increasing certain fees payable to the United States Patent Office.

That act provides for the payment of additional fees on presentation of certain claims during the prosecution of applications. This provision applies in the case of applications filed on or after October 25, 1965, the effective date of the act. In such cases, when any amendment is filed which presents additional claims over the total number covered by fees previously paid, it should be accompanied by any additional fees due.

As in the case of claims presented after an application is filed and before first action, described in the Notice of September 10, 1965, when independent claims are subsequently presented so that the number of uncanceled independent claims in the application as amended exceeds the number of such claims paid for, an additional fee of $10 is due for each such additional claim. Similarly, an additional fee of $2 is due for each claim added in excess of the number of uncanceled claims, independent or dependent, already paid for.

Treatment of Amendments Unaccompanied by Fees Due

Amendments filed during and after the prosecution of an application and not accompanied by the entire fee due upon such filing will be treated as follows:

If such an amendment is filed in reply to an Office action it will be regarded as not being fully responsive thereto and the practice set forth in section 714.03 of the Manual of Patent Examining Procedure will be followed, care being taken to avoid any abuse of this practice by attorneys as, for example, by habitual submission of such amendments without fees or with insufficient fees.

If an amendment which is not filed in response to an Office action is of such a nature as to require a fee and is not accompanied by the full fee required, it will not be entered and the applicant will be so advised.

Amendment During Interference

An amendment filed in connection with a motion to add counts to an interference (Rule 233) must be accompanied by the claim or claims to be added and with the appropriate fees, if any, which would be due if the amendments were to be entered. It may be that the amendments will never be entered. Only upon the granting of the motion is it necessary for the other party or parties to present the claims, but the fees must be paid whenever presented.

Claims which have been submitted in response to a suggestion by the Office for inclusion in an application must be accompanied by the fee due, if any.

Amendment After Requirement for Restriction

After a requirement for restriction or election of species, nonelected claims will be included in determining the fees due in connection with a subsequent amendment unless such claims are canceled.

Refunds

Money paid in excess or by mistake in connection with an amendment will be refunded in the usual manner.

Amendments affecting the claims cannot serve as the basis for granting any refund.

Money paid in connection with the filing of a proposed amendment will not be refunded by reason of the nonentry of the amendment.

EDWARD J. BRENNER,
Jan. 13, 1966. *Commissioner of Patents.*

[823 O.G. 814]

(26) DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

(27) PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on

modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will not be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

---

(28) DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

---

(29) PAYMENT OF ADDITIONAL FEES FOR CLAIMS

Section 41(a) 1 of Title 35 U.S. Code, provides that the Commissioner shall charge "On filing each application for an original patent, except in design cases, $65, in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. . . . Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner."

The Office accords filing dates to applications with insufficient fees provided the basic $65.00 filing fee is present. In such cases a notice is mailed requiring that the balance of the fee be paid within two months from the notification of the deficiency.

Occasionally applications contain informal claims that counsel feels should not be present. However, since alteration after execution and before filing is prohibited and could result in the application being stricken from the files, such applications must be filed in the form in which they are received from applicants. In the past the Office has charged fees for these informal claims, resulting in an unnecessary financial burden on applicants. In the future, applicants will be permitted to file with the application a preliminary amendment limited to cancellation of such claims, which will diminish the number of claims to be considered in calculating the filing fee to be paid. Any other changes should be the subject of a separate amendment.

On the other hand, if a preliminary amendment cancelling such claims does not accompany the application at the time the application is filed, the notification of the fee deficiency will inform applicant of his option of correcting the error by (1) paying the additional fee, or (2) filing an amendment cancelling claims, thereby reducing the number of claims to be considered in calculating the fee. However, it should be noted that once the fee for claims is paid, no refund will be made even though applicant later decides that certain claims are informal or otherwise unnecessary.

This change, which will become effective December 1, 1978, should benefit both applicants and the Office. It will alleviate applicants' financial burden and will also result in more efficient examination.

DONALD W. BANNER,
Nov. 9, 1978. *Commissioner of Patents and Trademarks.*

[977 O.G. 8]

APPLICATION CONTENT

(30) USE OF METRIC SYSTEM OF MEASUREMENTS IN PATENT APPLICATIONS

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

---

(31) FILING OF NON-ENGLISH LANGUAGE APPLICATIONS

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required by 35 U.S.C. 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and

(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(s); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. 1552]

---

(32) FILING OF COPIES OF PATENT APPLICATIONS

Beginning on October 1, 1978, the Office will accord a filing date to facsimile or other reproduced copies of United States national patent applications meeting the requirement of 35 U.S.C. 111, *provided:*

(1) the application was properly executed by the inventor(s) prior to transmission of the copy.

(2) the copy filed is a complete copy and bears a reproduction of applicant's signature, and

(3) the originally signed application is filed no later than two months after the facsimile or other reproduced copy is filed.

Authority for this practice is found in 35 U.S.C. 26 as interpreted by the District Court decisions *Neergaard* v. *Dann*, Civil Action No. 76-536, December 20, 1976 (D.D.C.) and *Dietzel et al.* v. *Commissioner of Patents and Trademarks*, Civil Action No. 75-0298, December 22, 1976 (D.D.C.).

In order to ensure prompt association with the copy of the application initially filed it is strongly recommended that the subsequently filed original application be accompanied by a cover letter signed by the applicant or the attorney or agent averring it is the original of the earlier filed facsimile application, identifying the application by applicant's name, title of invention, date of initial filing and serial number, if known.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be used routinely for filing applications.

The above procedure does not apply to international applications filed under the Patent Cooperation Treaty since procedures to cover unsigned international applications are already provided for in PCT Article 14(1)(a)(i) and (b) and PCT Rule 26.2.

DONALD W. BANNER,
Aug. 28, 1978. *Commissioner of Patents and Trademarks.*

[974 O.G. 14]

---

(33) GRAPHICAL ILLUSTRATIONS IN THE SPECIFICATION

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Jan. 12, 1978.

[967 O.G. 2]

---

(34) MULTIPLE DEPENDENT CLAIMS AND NEW DRAWING FILING REQUIREMENTS

Introduction

On January 24, 1978, Public Law 94-131 (pages 108-115 of "Patent Laws," August 1976 issue) and the Patent Cooperation Treaty came into force. This public law amends the patent statute, Title 35, United States Code, by providing for procedures and requirements set forth in the Patent Cooperation Treaty. Some of these statutory amendments also effect the laws governing the processing and examination of regular United States national applications filed on and after January 24, 1978.

The amendments of the patent law which will affect *U.S. patent applications filed on and after January 24, 1978,* relate to two elements of the patent application: the claims and the drawings. With regard to claims, the amendments to 35 U.S.C. 41 and 112 provide for multiple dependent claims in accordance with PCT Rule 6.4. With regard to drawings, the amendment to 35 U.S.C. 113 changes the requirements for filing drawings in order to obtain a filing date in accordance with PCT Article 7.

Purpose

This memorandum establishes in more detail the new procedures required by the amended statute. Any questions concerning these instructions may be directed to either Mary Turowski (extension 7-3776) in the administration area or Louis Maassel (extension 7-3070) in the examining area.

Revised 37 CFR sections 1.75(c), (f) and (g); and 1.81 and 1.83(c) were published in the OFFICIAL GAZETTE of February 21, 1978.

MULTIPLE DEPENDENT CLAIMS

Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim.

The second paragraph of 35 U.S.C. section 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus, section 112 authorizes multiple dependent claims, as long as they are in the alternative form (e.g., "A machine according to claims 3 *or* 4, further comprising . . ."). Cumulative claiming (e.g., "A machine according to claims 3 *and* 4, further comprising . . .") is *not* permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as "A device as in claims 1, 2, 3 or 4, made by a process of claims 5, 6, 7 or 8" is improper. Section 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may *not* serve as a basis for any other multiple dependent claim, either directly or indirectly. These

limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim.

The amendment of the second paragraph of section 112 further clarifies that the limitations or elements of each claim incorporated by reference into a multiple dependent claim must be considered separately. Thus, a multiple dependent claim, as such, does not contain all the limitations of all the alternative claims to which it refers, but rather, contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration. Hence, a multiple dependent claim must be considered in the same manner as a plurality of single dependent claims.

Restriction Practice

For restriction purposes, each embodiment of a multiple dependent claim will be considered in the same manner as a single dependent claim. Therefore, restriction may be required between the embodiments of a multiple dependent claim. Also, some embodiments of a multiple dependent claim may be held withdrawn while other embodiments are considered on their merits.

Handling of Multiple Dependent Claims by the Application Division

The Application Division will be responsible for verifying whether multiple dependent claims filed with the application are in proper alternative form, that they depend only upon prior independent and single dependent claims and also for calculating the amount of the filing fee. A new form, PTO–1360, has been designed to be used in conjunction with the current fee calculation form PTO–875.

Handling of Multiple Dependent Claims by the Examining Group Clerical Staff

The examining group clerical staff is responsible for verifying compliance with the statute and rules of multiple dependent claims added by amendment and for calculating the amount of any additional fees required. This calculation should be performed on form PTO–1360.

If a multiple dependent claim (or claims) is added in an amendment without the proper fee, the amendment will not be entered until the fee has been received. In view of the requirements for multiple dependent claims, no amendment containing new claims or changing the dependency of claims will be entered before checking whether the paid fees cover the costs of the amended claims. The applicant, or his attorney or agent, will usually be contacted to pay the additional fee in the same manner as currently in existence for such defects. Where a letter is written in insufficient fee situations, a copy of the multiple dependent claim fee calculation form PTO–1360 will be included for applicant's information.

Handling of Dependent Claims by the Examiner

Should any multiple dependent claim be in an application filed prior to January 24, 1978 or include a claim association or claim structure that violates any of the prohibitions, the claim will be objected to as not being in proper form as required by 37 CFR 1.75 in the next Office action. Such an improper claim will not be further treated on the merits.

When referring to a singular dependent claim or a single embodiment of a multiple dependent claim, as when making a rejection, such a claim or embodiment will be referred to by using the number of all of the claims involved in that claim or embodiment, starting with the highest. For example, if claim 2 was dependent on claim 1, the notations would be 2/1. If in the same application, claim 3 was independent and claim 4 was multiple dependent on claims 2 or 3, the notations would be 4/2/1 and 4/3. Furthermore, if claim 5 depended from claim 4, the notations would be 5/4/2/1 and 5/4/3. Each of these embodiments will be treated individually. It would be possible for claim 4/2/1 to be rejected under section 102 and claim 4/3 to be indicated as avoiding the prior art and being allowable if rewritten in independent form. A number of embodiments may be grouped together if there is a common ground of rejection, but it must be clear how each embodiment is treated.

A claim, such as claim 4, will not be allowed until all embodiments covered thereby are allowable. If an embodiment of a multiple dependent claim avoids the art while other embodiments are rejected over prior art, a statement will be made that that embodiment avoids the art and would be allowed if rewritten in separate dependent or independent form. Wording similar to the following may be used:

> "Embodiment ———— would be allowable if rewritten as a proper dependent or independent claim which contains only the limitations of this embodiment."

Calculation of Fees When Multiple Dependent Claims are Presented, Use of Form PTO–1360

To assist in the computation of the fees for multiple dependent claims, a separate "Multiple Dependent Claim Fee Calculation Sheet," form PTO–1360, has been designed for use with the current "Patent Application Fee Determination Record," form PTO–875. Form PTO–1360 will be placed in the file wrapper by the Application Division where multiple dependent claims are in the application as filed. If multiple dependent claims are not included upon filing, but are later added by amendment, the examining group clerical staff will place the form in the file wrapper. If there are multiple dependent claims in the application, the total number of independent and dependent claims for fee purposes will be calculated on form PTO–1360 and the total number of claims and number of independent claims will then be placed on form PTO–875 for final fee calculation purposes.

If at least $65 is included with the application on filing, but the total fee is insufficient, a "Notice of Insufficient Fee," form PTO–1094, is placed in the file wrapper by the Application Division as is currently done. The notice will be mailed by the examining group in accordance with established procedures.

Calculating Fees for Multiple Dependent Claims

Proper Multiple Dependent Claims

Amended section 41(a) of title 35, U.S.C., provides that claims in multiple dependent form cannot be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim would be considered to be that number of dependent claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim would also be considered as the same number of dependent claims as referred to in the multiple dependent claim from which it depends.

Improper Multiple Dependent Claim

If any multiple dependent claim is improper, Application Division may indicate that fact by placing an encircled numeral "1" in the "Dep. Claims" column of form PTO–1360. The fee for any improper multiple dependent claim, whether it is defective for not being in the alternative form or for being directly or indirectly dependent on a prior multiple dependent claim, will only be one, since only an objection to the form of such a claim will normally be made.

This procedure also greatly simplifies the calculation of fees. Any claim depending from an improper multiple dependent claim will also be considered to be improper and be counted as one dependent claim.

FEE CALCULATION EXAMPLE

Claim Number	
1	Independent
2	Dependent on claim 1
3	Dependent on claim 2
4	Dependent on claim 2 or 3
5	Dependent on claim 4
6	Dependent on claim 5
7	Dependent on claim 1 or 4
8	Dependent on claim 1 or 5
9	Dependent on claim 8

10 Independent
11 Dependent on claim 1 or 10
12 Dependent on claim 1 and 10

FORM PTO-1360 (1/78) U.S. DEPT. COMM. PAT. AND TMK. OFF.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

(FOR USE WITH FORM PTO-875)

	AS FILED		AFTER 1ST AMDT		AFTER 2ND AMDT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2		1				
3		1				
4		2				
5		2				
6		2				
7		⑦				
8		⑧				
9		⑨				
10	1					
11		2				
12		⑫				
TOTAL IND.	2					
TOTAL DEP.	14	↵		↵		↵
TOTAL CLAIMS	16					

Comments on Fee Calculation Example

Claim 1.—This is an independent claim; therefore, a numeral "1" is placed opposite claim number 1 in the "Ind." column.

Claim 2.—Since this is a claim dependent on a single independent claim, a numeral "1" is placed opposite claim number 2 in the "Dep." column.

Claim 3.—Claim 3 is also a single dependent claim, so a numeral "1" is placed in the "Dep." column.

Claim 4.—Claim 4 is a proper multiple dependent claim. It refers directly to two claims in the alternative, namely, claims 2 or 3. Therefore, a numeral "2" to indicate direct reference to two claims is placed in the "Dep." column opposite claim number 4.

Claim 5.—This claim is a singularly dependent claim depending from a multiple dependent claim. For fee calculation purposes, such a claim is counted as being that number of claims to which direct reference is made in the multiple dependent claim which it depends. In this case, the multiple dependent claim number 4 it depends from counts as 2 claims; therefore, claim 5 also counts as 2 claims. Accordingly, a numeral "2" is placed opposite claim number 5 in the "Dep." column.

Claim 6.—Claim 6 depends indirectly from a multiple dependent claim 4. Since claim 4 counts as 2 claims, claim 6 also counts as 2 dependent claims. Consequently, a numeral "2" is placed in the "Dep." column after claim 6.

Claim 7.—This claim is a multiple dependent claim since it refers to claims 1 or 4. However, as can be seen by looking at the "2" in the "Dep." column opposite claim 4, claim 7 directly depends from a multiple dependent claim. This practice is improper under 35 U.S.C. 112 and Rule 1.75(c). Following the procedure for calculating fees for improper multiple dependent claims, a numeral "1" is placed in the "Dep." column with a circle drawn around it to alert the examiner that the claim is improper.

Claim 8.—This claim is a multiple dependent claim since it refers to claims 1 or 5. However, since claim 5 depends from multiple dependent claim 4, claim 8 indirectly depends from multiple dependent claim 4 through claim 5. This practice is improper. See MULTIPLE DEPENDENT CLAIMS, paragraph 2, above. Consequently, a numeral "1" is placed in the dependent claim column with a circle drawn around it.

Claim 9.—Claim 9 is improper since it depends from an improper claim. If the base claim is in error, this error cannot be corrected by adding additional claims depending therefrom. Therefore, a numeral "1" with a circle around it is placed in the "Dep." column.

Claim 10.—Here again we have an independent claim which is always indicated with a numeral "1" in the "Ind." column opposite the claim number.

Claim 11.—This claim refers to two independent claims in the alternative. A numeral "2" is therefore placed in the "Dep." column opposite claim 11.

Claim 12.—Claim 12 is a dependent claim which refers to two claims in the conjunctive ("1 *and* 10") rather than in the alternative ("1 *or* 10"). This form is improper under 35 U.S.C. 112 and Rule 1.75(c). Accordingly, since claim 12 is improper, an encircled numeral "1" is placed in the "Dep." column opposite claim 12.

Calculation of Filing Fee

After the numbers of "Ind." and "Dep." claims are noted on form PTO–1360, each column is added. In this example, there are 2 independent claims and 14 dependent claims or a total of 16 claims. The number of independent and total claims can then be placed on form PTO–875 and the fee calculated. In this example, the total number of claims 16 minus 10 leaves 6, which is multiplied by $2 for an additional total claim fee of $12. The total number of independent claims in the example is 2, which minus 1 is 1, which times the $10 rate is $10. The total filing fee is therefore $65+ $12 + $10, or a total of $87.

DRAWING REQUIREMENTS

Revised 35 U.S.C. 113 relaxes the previous requirements for submission of drawings on filing under certain conditions. The first sentence of 35 U.S.C. 113 does require a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention. In this situation the lack of a drawing renders the application incomplete and as such, the application cannot be given a filing date until the drawing is received. The second sentence of 35 U.S.C. 113 deals with the situation wherein a drawing is not necessary for the understanding of the invention but the case admits of illustration and no drawing was submited on filing. The lack of the drawing in this situation does not render the application incomplete but rather is treated much in the same manner as an informality. The examiner should require such drawings in almost all such instances. Such drawings could be required during the processing of the application but do not have to be furnished at the time the application is filed. The applicant is allowed at least two months from the date of the letter requiring drawings to submit them.

Handling of Drawing Requirements Under the First Sentence of 35 U.S.C. 113

Under the revised provisions the Application Division examiner will continue to make the initial decision in all new applications as to whether a drawing is "necessary" under the first sentence of 35 U.S.C. 113.

If during examination an examiner feels that a filing date should not have been granted in an application because it does not contain drawings, the matter will be brought to the attention of the Supervisory Primary Examiner (SPE) for review. If the SPE decides that drawings are required to understand the subject matter of the invention, the SPE will return the application to the Application Division with a memorandum requesting cancellation of the filing date and identifying the subject matter required to be illustrated.

Handling of Drawing Requirements Under the Second Sentence of 35 U.S.C. 113

35 U.S.C. 113 also deals with the situation wherein the drawing is not necessary for the understanding of the in-

vention, but the subject matter admits of illustration by a drawing and the applicant has not furnished a drawing. The lack of the drawing in this situation does not render the application incomplete but rather is treated as an informality. A filing date will be accorded with the original presentation of the papers, despite the absence of drawings. In these situations, a drawing or further illustration will normally be required by the examiner. This may be done either prior to examination in a separate letter or in the first Office action and may be handled in much the same manner as informal photocopy drawings are presently handled. The examiner should require drawings where appropriate as early as possible, since the possession of the drawing at that time would facilitate the examination process. A letter requiring drawings may contain wording similar to the following:

> "The examiner has decided that the subject matter of this application admits of illustration by a drawing and that a drawing would facilitate the understanding of the subject matter disclosed. (Continue with a specific mention of those items of which drawings are desired.) Applicant is required to furnish a drawing under 37 CFR 1.81. (Incorporate in Office action or set two-month period for response.)"

The applicant will be given at least two months from the date of such requirement to submit drawings. If the requirement for drawings is included in an Office action, the time for supplying the drawings will be the same as the time of response to the Office action. Upon receipt of the drawing within the period set, the examiner will check the drawings for new matter. If new matter is included, the drawing will not be entered. It will be objected to as containing new matter. A new drawing without such new matter may be required if the examiner still feels a drawing is needed under 37 CFR 1.81 or 1.83. The examiner's decision would be reviewable by petition to the Commissioner under Rule 1.181. The decision on such a petition would be handled by the Group Director. If a drawing is not timely received in response to a letter from the examiner which requires a drawing, the application becomes abandoned for failure to respond.

Date Feb. 8, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[968 O.G. 7]

---

(35) EXECUTION AND FILING OF PATENT APPLICATIONS

This notice is intended as a reminder that United States patent applications which have not been prepared and executed in accordance with the requirements of Title 35 of the United States Code and Title 37 of the Code of Federal Regulations may be denied a filing date as a complete application or may be, in appropriate circumstances, stricken from the files as having been improperly executed and/or filed. Although the statute and the rules have been in existence for many years, the Office continues to receive a number of applications which have been improperly executed and/or filed. Since the improper execution and/or filing of patent applications can ultimately result in a loss of rights it is appropriate to re-emphasize the importance of proper execution and filing.

Attention is invited to the fact that 35 U.S.C. 111 requires that "(t)he application must be signed by the applicant . . ." The same requirement appears in 37 CFR 1.57 which specifies that the signature to the oath or declaration "will be accepted as the signature to the application provided the oath or declaration . . . is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims."

It should be carefully noted that the application "signed by the applicant" must be a *complete* application and cannot be simply an oath or declaration signed without the remainder of the application. As an example, it is improper for an applicant to sign an oath or declaration which is later attached to a specification and/or claims unless the specification is also signed after the claims. See 37 CFR 1.56(c) which provides that "(a)ny application may be stricken from the files if: (1) Signed or sworn to in blank, or without actual inspection by the applicant . . ."

The provisions of 35 U.S.C. 363 for filing an international application under the Patent Cooperation Treaty (PCT) which designates the United States and thereby has the effect of a regularly filed United States national application, except as provided in 35 U.S.C. 102(e), are somewhat different than the provisions of 35 U.S.C. 111. Under 35 U.S.C. 363 and PCT Article 11(1), the signature of the inventor is not required to obtain a filing date but must be submitted later. The oath or declaration requirements for an international application before the Patent and Trademark Office are set forth in 37 CFR 1.70.

The requirement that applicant sign "the application" also precludes alterations to the application after execution. See 37 CFR 1.52(c) which states that "(n)o . . . alterations are permissible after execution of the application papers." It is therefore necessary that the application, including the oath or declaration, be executed in the form in which it is intended to be filed since it is improper for anyone, including counsel, to complete or otherwise alter application papers, including the oath or declaration, after the applicant has executed the same. Section 1.56(c) provides that "(a)ny application may be stricken from the files if: . . . (2) Altered or partly filled in after being signed or sworn to."

In summary, it is emphasized that the application filed must be the application executed by the applicant and it is improper for anyone, including counsel, to alter, rewrite, or partly fill in any part of the application, including the oath or declaration, after execution by the applicant. This reminder should particularly be brought to the attention of foreign applicants by their United States counsel since the United States law and practice in this area may differ from that in other countries. Hopefully, this Notice will serve as an adequate reminder so that applicants will not lose rights through the improper execution and/or filing of patent applications.

Oct. 11, 1979. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

[988 O.G. 2]

---

(36) USE OF SYMBOL "Ø" IN PATENT APPLICATIONS

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "O" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any question about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the

patentee's expense (37 CFR 1.323) because the intended symbol was not accurately presented by the Greek upper or lower case Phi letters (Φ, φ) in the patent application.

RICHARD J. SHAKMAN,
Dec. 20, 1978. *Assistant Commissioner for Administration.*

[978 O.G. 152]

EXAMINATION OF APPLICATIONS

(37) EXAMINATION OF CLAIMS FOR PATENTABILITY UNDER 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.*, 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

[949 O.G. 3]

(38) CLAIMS COPIED FROM PATENTS

Applicants and their attorneys or agents are reminded of the requirement of Rule 205(b) (37 CFR 1.205(b)) of the Rules of Practice that "Where an applicant presents a claim copied or substantially copied from a patent, he must, at the time he presents the claim, identify the patent, give the number of the patented claim, and specifically apply the terms of the copied claim to his own disclosure, unless the claim is copied in response to a suggestion by the Office."

The requirement of Rule 205(b) (37 CFR 1.205(b)) applies to claims copied in an application at the time of filing as well as to claims copied in an amendment to a pending application. If an applicant, attorney, or agent presents a claim copied or substantially copied from a patent without complying wtih Rule 205(b) (37 CFR 1.205(b)) the examiner may be led into making an action different from what he would have made had he been in possession of all the facts. Therefore, failure to comply with Rule 205(b) (37 CFR 1.205(b)), when submitting a claim copied from a patent, may result in the issuance of an Order To Show Cause why the application should not be stricken from the files of the Patent Office. If a satisfactory answer is not filed within the period set in the Order it may be necessary to strike the application under Rule 56 (37 CFR 1.56).

This reminder is being published to emphasize to applicants and their attorneys or agents the importance of complying with the requirement of Rule 205(b) (37 CFR 1.205(b)) at the time the claim is copied.

WILLIAM FELDMAN,
Apr. 10, 1974. *Acting Assistant Commissioner for Patents.*

[922 O.G. 442]

(39) EXAMINATION OF PATENT APPLICATIONS HAVING AN ISSUE OF FRAUD

This notice deals with the general procedures established within the Patent Office for the handling, during ex parte examination, of applications in which, or in relation to which, some facts appear or representations are made raising an issue of fraud.

Such applications should be forwarded by the examiner to the Office of the Assistant Commissioner for Patents as soon as the facts or representations are discovered. The application will then be reviewed and a determination made as to whether immediate action on the issue of fraud is necessary or whether the consideration of such an issue should be delayed until after the normal ex parte examination by the examiner (if such examination has not previously taken place).

Where compelling reasons dictate immediate action, the application will not be returned to the examining group for normal ex parte examination until such action is complete. Otherwise, the application will be returned to the examining group. The examiner will complete the examination as to all matters except that any issues relating to possible fraud will not be considered or commented upon. When this examination is completed the application will be returned to the Office of the Assistant Commissioner for Patents. An investigation will then be undertaken to resolve the issues relating to the possible fraud. Such an investigation may include a requirement for additional information from applicant, or from the examiner, should it be necessary for the proper conduct of the investigation.

If the investigation reveals a prima facie case of fraud an Order to Show Cause why the application should not be stricken under Rule 56 of the Rules of Practice [37 CFR 1.56] will be issued.

If a prima facie case of fraud does not exist, or is adequately rebutted, a decision will be entered in the application file stating that the Patent Office has found no evidence necessitating striking the application. The application will then be returned to the examining group or other appropriate Patent Office section for further action.

WILLIAM FELDMAN,
Jan. 2, 1975. *Acting Assistant Commissioner for Patents.*

[930 O.G. 1455]

(40) RESTRICTION BETWEEN INVENTIONS

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

---

(41) REVISED PRACTICE RE MARKUSH-TYPE CLAIMS

This notice deals with Markush-type generic claims which include a plurality of alternatively usable substances or members. In most cases, a recitation by enumeration is used because there is no appropriate or true generic language. In many cases, the Markush-type claims include independent and distinct inventions. This is true where two or more of the members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

In applications containing claims of that nature, the Examiner may require a provisional election of a single species prior to examination on the merits. The provisional election will be given effect in the event that the Markush-type claim should be found not allowable. Following election, the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. Should the Markush-type claim be found not allowable, examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

As an example, in the case of an application with a Markush-type claim drawn to the compound C-R, wherein R is a radical selected from the group consisting of A, B, C, D, and E, the Examiner may require a provisional election of a single species, CA, CB, CC, CD, or CE. The Markush-type claim would then be examined fully with respect to the elected species and any species considered to be clearly unpatentable over the elected species. If on examination the elected species is found to be anticipated or rendered obvious by prior art, the Markush-type claim and claims to the elected species shall be rejected, and claims to the non-elected species would be held withdrawn from further consideration. As in the prevailing practice, a second action on the rejected claims would be made final.

On the other hand, should no prior art be found that anticipates or renders obvious the elected species, the search of the Markush-type claim will be extended. If prior art is then found that anticipates or renders obvious the Markush-type claim with respect to a ***non-elected species***, the Markush-type claim shall be rejected and claims to the non-elected species held withdrawn from further consideration. The prior art search, however, will not be extended unnecessarily to cover all non-elected species. Should applicant, in response to this rejection of the Markush-type claim, overcome the rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be re-examined. The prior art search will be extended to the extent necessary to determine patentability of the Markush-type claim. In the event prior art is found during the re-examination that anticipates or renders obvious the amended Markush-type claim, the claim will be rejected and the action made final. Amendments submitted after the final rejection further restricting the scope of the claim will not be entered.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the Examiner is encouraged to examine all claims on the merits, even though they are directed to independent and distinct inventions. In such a case, the Examiner will not follow the above procedure and will not require restriction.

This notice supersedes the practice set out in 922 O.G. 1016, dated May 1, 1974.

Although the above practice is now in effect, a rule change proposal is also being considered to provide for prosecution of multiple inventions in a single patent application by submission of additional fees.

DONALD W. BANNER,
Oct. 23, 1978. *Commissioner of Patents and Trademarks.*

[976 O.G. 128]

---

(42) REVISED PROCEDURES FOR RECORDING SEARCHES AND CONSIDERATIONS OF CERTAIN PRIOR ART

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO–892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass*, including all United States and foreign patent documents and other publications placed therein.
   The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass*, for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B. 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.

3. *An update of a search previously made.*
This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.

When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. ————————)" wil be recorded. If the parent has been patented, the patent number "Pat. N. ————————" instead of serial number in the above phrase will be recorded.

4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO–1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. The examiner will place one copy of the form PTO–1041 in the application file on the right flap of the file jacket, the other copy of the form PTO–1041 will be forwarded to the Office of Search Systems.

When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. *"SEARCH NOTES" Box Entries*

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search,* or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant.

The classification will be recorded, followed by "(Cursory)."

2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise. The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.

3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:

a. *Abstracting publications,* such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index and the period covered will be recorded.

b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.

c. *Books*—The title and author, edition or date, as appropriate, will be recorded.

d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).

Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.

e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.

There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service.

These search systems include many data bases.

A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.

4. A search of only the *publications in a subclass.*
The class and subclass followed by "(publications only)" will be recorded.

5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention.

The serial number of a parent application that is still pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted.

The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. *Not Recorded*

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below.

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*

In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.

2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*

In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Date: 2–22–77.

[956 O.G. 1546]

---

(43) EXPRESS ABANDONMENTS

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(l) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

[934 O.G. 2]

---

(44) NOTICE OF ABANDONMENT FOR FAILURE TO PROSECUTE APPLICATION

Effective immeditely the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: ————————. In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976; 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

---

(45) NEW PROCEDURES FOR RECORDATION OF INTERVIEWS

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the OFFICIAL GAZETTE of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in Setion 713.04 of the Manual of

Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

— Serial Number of the application
— Name of applicant
— Name of examiner
— Date of interview
— Type of interview (personal or telephone)
— Name of participant(s) (applicant, attorney or agent, etc.)
— An indication whether or not an exhibit was shown or a demonstration conducted
— An identification of the claims discussed
— An identification of the specific prior art discussed
— An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
— The signature of the examiner who conducted the interview
— Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 21]

---

(46) STATEMENTS FILED UNDER ATOMIC ENERGY ACT AND NASA ACT

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (a) the full facts in regard to the making or conception of the invention, and (b) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an application which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the state-

ments must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 13, 1973.

[914 O.G. 2]

---

(47) EXTENSIONS OF TIME TO SUBMIT AFFIDAVITS AFTER FINAL REJECTION

Not infrequently, applicants request an extension of time, stating as a reason therefor that more time is needed in which to submit an affidavit. When such a request is filed after final rejection, the granting of the request for extension of time is without prejudice to the right of the examiner to question why the affidavit is now necessary and why it was not earlier presented. If applicant's showing is insufficient, the examiner may deny entry of the affidavit, notwithstanding the previous grant of an extension of time to submit it. The grant of an extension of time in these circumstances serves merely to keep the case from becoming abandoned while allowing the applicant the opportunity to present the affidavit or to take other appropriate action. Moreover, prosecution of the application to save it from abandonment must include such timely, complete and proper action as required by 37 CFR 1.113. The admission of the affidavit for purposes other than allowance of the application, or the refusal to admit the affidavit, and any proceedings relative thereto, shall not operate to save the application from abondonment.

Implicit in the above practice is the fact that affidavits submitted after final rejection are subject to the same treatment as amendments submitted after final rejection. *In re Affidavit Filed After Final Rejection,* 152 USPQ 292, 1966 C.D. 53.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

July 25, 1977.

[961 O.G. 16]

---

(48) EXTENSION OF TIME LIMIT

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(e), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Nov. 28, 1977.

[965 O.G. 14]

---

(49) TRANSLATIONS OF FOREIGN LANGUAGE REFERENCES

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible, 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If identifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Date: Oct. 26, 1977.

[964 O.G. 24]

---

(50) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER 1—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received, and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters which were contained in the published proposal, separate notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office OFFICIAL GAZETTE in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

PURPOSE OF RULES

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

REISSUE APPLICATIONS

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed with in § 1.175(a)(1) unless the applicant believes that to be the case. Section 1.175(a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the OFFICIAL GAZETTE. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the OFFICIAL GAZETTE announcement of filing.

A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

PROTESTS AND PUBLIC USE PROCEEDINGS

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to sumit additional written information or may provide extra time for comments by a protester to be filed.

---

[1] See *In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

[2] See *In re Oda*, 443 F. 2d 1200, 170 USPQ 268 (CCPA 1971).

[3] *International Paper Co.* v. *Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs [4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond § 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

DUTY OF DISCLOSURE

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The Court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making." [6]

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent

[4] 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945.

[5] 426 U.S. ——, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

[6] 426 U.S. at ——, 48 L. Ed. 2d at 765, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.

and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.[8] Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of §§ 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

[7] See discussion accompanying proposed rules in Federal Register of October 4, 1976, page 43731, first sentence.

[8] *Norton v. Curtiss*, 433 F. 2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

PRIOR ART STATEMENT

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior art listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not a representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

[9] E.g., Federal Register of September 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, § 131(b).

A notice published in 1974 [10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorneys and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

FOREIGN LANGUAGE OATHS

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the OFFICIAL GAZETTE at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure, § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filing an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

DECISIONS AND FILES MADE PUBLIC

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act [12] required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation [13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by

---

[10] Notice of August 12, 1974, 926 O.G. 2.

[11] BNA's Patent, Trademark and Copyright Journal, No. 301, October 28, 1976, page D-1.

[12] 5 USC 552.

[13] *Irons* v. *Gottschalk*, Slip Opinion, No. 74-1365 (D.C. Cir., October 21, 1976).

making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

PATENT APPEALS

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearng is held.

In appeals where the appellant has requested an oral hearing, § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in approprite circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

REASONS FOR ALLOWANCE

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive; when an examiner allows a claim on the first Office action after citing very close prior art; and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal.

---

[14] See notice of March 20, 1975, 933 O.G. 1010.
[15] MPEP, § 1209.
[16] See notice of March 20, 1975, 933 O.G. 1010.

[Text of adopted rules appears in 37 CFR, revised 7-1-77]

Effective Date. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Date: Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.

Date: Jan. 19, 1977.

[955 O.G. 1054]

---

(51) GUIDELINES FOR IMPLEMENTATION OF RECENTLY REVISED RULES

Recently a number of rules relating to Patent Examining and Appeal Procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the OFFICIAL GAZETTE at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97-1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(NOTE.—These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the OFFICIAL GAZETTE and will include certain identifying data as specified in section 1.11(b). Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.
2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 10, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closest prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filing of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmit an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL-327), an examiner's amendment (PTOL-37), or a Notice of Allowance (PTOL-85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(a) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(b) A timely affidavit under 37 CFR 1.131 with respect to the material cited; or
(c) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following:

> If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL–327) or Examiner's Amendment (PTOL–37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals.

Under Section 1.194, the following procedures will be in effect:

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.
2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.
3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.
4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.
5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a desire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed:

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided, In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.
2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.
3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.
4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowingly be ignored. If protests are not timely submitted or if they fail to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO–892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

---

(52) FURTHER GUIDELINES RELATING TO 37 CFR 1.175 AND 1.291, AS AMENDED EFFECTIVE MARCH 1, 1977

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented. The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two OFFICIAL GAZETTE publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22–32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401–1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises

questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred."[1] This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificity about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)–(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97–1.99 to comply with the duty of disclosure required by Section 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be available to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)

The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401–1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the

[1] The text of sub-section (a)(5) is incorrectly reproduced in the July 1977 revision of Title 37 CFR. The text, as quoted herein, is correct.

reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and sub-sections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments.* If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next Office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

The Filing of Protests Under 37 CFR 1.291

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Official Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

The Examiner's Consideration of Protests

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO–892. If the examiner does not cite all of the prior art or other documents on form PTO–892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO–892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on _____ and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by _____ _____."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of, the Office.

If the protestor has access to the application, the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

> "The protest, as filed_____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made within ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

DONALD W. BANNER,
Commissioner of Patents & Trademarks.

Nov. 13, 1978.

[977 O.G. 11]

---

(53) EXPEDITED PROCESSING OF REISSUE APPLICATIONS AND APPLICATIONS HAVING ISSUES OF FRAUD OR FAILURE TO COMPLY WITH THE DUTY OF DISCLOSURE

The Patent and Trademark Office has been experiencing increasing delays in the examination of reissue applications and other applications in which charges or questions of fraud or failure to comply with the duty of disclosure have been raised or are apparent on the record. Consideration of these charges involves considerable expenditures of resources and time. They also tend to delay prompt consideration on the merits in view of the prior art, etc. Considerable duplication of effort and expenditures of resources and time also may occur when the Office considers applications in circumstances where the same issues are concurrently being considered in Court.

Deferral of Fraud Issues

Effective immediately, the Office is instituting a policy of delaying consideration of issues of fraud or failure to comply with the duty of disclosure in any application until all other issues are settled.

Accordingly, under this procedure, applications having issues of fraud or failure to comply with the duty of disclosure will continue to be referred to the Office of the Assistant Commissioner for Patents, but will then be promptly returned, along with any appropriate examining instructions, to the Director of the Examining Group for immediate action by the Examiner. Decisions on Petitions to Strike applications pursuant to 37 CFR 1.56(d) will be deferred pending resolution of the patentability issues before the Examiner. Any such Petitions to Strike filed after the Office of the Assistant Commissioner has initially reviewed the application and returned it for immediate action will be acknowledged by the Examining Group Director and action on the Petition will be deferred pending completion of the patentability issues before the Examiner. Examiners will note in their Office actions the existence of issues of fraud or failure to comply with the duty of disclosure without commenting on the substance of such issues and will indicate that the issues will be considered after all other matters have been disposed of. Matters other than fraud or failure to comply with the duty of disclosure raised in a Petition to Strike, e.g., patentability in light of a reference, will be treated by the Examiner or other appropriate official. Petitions relating to procedural matters involving the examination of the applications, e.g., requests for protestor participation in interviews, will be decided by the appropriate Examining Group Director. Applications which have been referred to the Office of the Assistant Commissioner and which are required to be returned thereto before allowance or after abandonment of the application will have a notation placed on the face of the application file by the Office of the Assistant Commissioner requiring such return.

Suspension of Action Where There is Concurrent Litigation

In order to avoid duplication of effort, actions in applications in which there is an indication of concurrent litigation will be suspended automatically unless and until it is evident to the examiner, or the applicant indicates, that: (1) a stay of the litigation is in effect; (2) the litigation has been terminated; (3) there are no significant overlapping issues between the application and the litigation; or (4) it is applicant's desire that the application be examined at that time.

Expedited Examination of Reissues

All reissue applications, except those under suspension because of litigation, will be taken up for action ahead of other "special" applications; this means that all issues not deferred will be treated and responded to *immediately*. Furthermore, reissue applications involved in "stayed litigation" will be taken up for action in advance of other reissue applications.

Insofar as reissue applications for patents in litigation are concerned, the Office is presently considering modifications to the rules to provide for their examination within the two-month waiting period now provided by Section 1.176. Until appropriate modifications are made to the rules, the Office will entertain petitions under 37 CFR 1.183 to waive the delay period of 37 CFR 1.176. In addition, the Office is presently considering requiring the prompt disclosure of the existence of litigation related to a pending application.

Time monitoring systems are being put into effect which will closely monitor the time used by applicants, protestors, and examiners in processing reissue applications of patents involved in litigation in which the court has stayed further action.

Applicants in reissue applications involved in litigation which has been stayed, dismissed, etc. for consideration by the Patent and Trademark Office will normally be given one month to respond to Office actions in those situations where the Office determines that the reissue applicant can readily prepare a response in such time. This one month period may be extended upon a showing of clear justification. Of course, up to three months may be set for response if the Examiner determines such a period is justified.

Applicants and protestors submitting papers for entry in reissue applications of patents involved in litigation are requested to mark the outside envelope and the top right hand portion of the paper with the words *"REISSUE LITIGATION"* and with the unit of the PTO in which the reissue application is located—e.g., Assistant Commissioner for Patents, Board of Appeals or Examining Group. The notations preferably should be written in a bright color with a felt point marker. Papers marked *"REISSUE LITIGATION"* will be given special attention. Also, the PTO will place a prominent notation on the application file to indicate the existence of litigation.

The purpose of these changes is to reduce the time between filing and final action insofar as possible while still giving all parties sufficient time to be heard. This notice is supplemental to, and in some respects modifies, the earlier published notices on this subject and particularly the notice published at 977 O.G. 11 on December 12, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

June 5, 1979.

[988 O.G. 24]

---

(54) PRIOR ART CITED BY PATENT OFFICES IN OTHER COUNTRIES

Section 1.56 of Title 37 of the Code of Federal Regulations requires patent applicants and others associated with the prosecution of a patent application before the U.S. Patent and Trademark Office to call to the Office's attention information which is material to examination. Where related or corresponding patent applications have been filed in other countries, prior art may be cited by the Patent Offices of those other countries in connection with the examination of the applications filed there. Where prior art is cited by those other Patent Offices while the U.S. application is pending, citations which are material to examination in this country and known to any of the individuals covered by Section 1.56 must be called to the attention of this Office. Attorneys and agents are reminded of their obligations in this respect.

It is suggested, of course, that such prior art be cited to the U.S. Patent and Trademark Office in a prior art statement which complies with the provisions of Sections 1.97–1.99 of 37 CFR.

April 23, 1979. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[982 O.G. 36]

---

(55) DEPOSIT OF COMPUTER PROGRAM LISTINGS

[37 CFR Part 1]

Notice of Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Rule.

SUMMARY: This proposed rule would amend the rules of practice to provide special procedures for presentation of

computer program listings in patent applications. This proposal would reduce the present burden of presenting such listings on paper and would also reduce expenses for both the patent applicant and the Patent and Trademark Office.

DATES: Comments must be received on or before: September 13, 1977. Hearing: September 13, 1977, beginning at 9:30 a.m.

ADDRESSES: Send comments to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. The hearing will be held in Room 11C24 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and transcript of hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (68 Stat. 793; 85 Stat. 364; 88 Stat. 1949; 35 U.S.C. 6 as amended) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending Sections 1.21 and 1.77 and by adding a new Section 1.96. This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The purpose of the proposed rule change is to provide suitable procedures for presenting computer program listings where such listings are submitted with applications for patent to fulfill the disclosure requirements under 35 U.S.C. 112.

This proposal does not in any way imply that the Patent and Trademark Office considers computer programs per se to be patentable subject matter.

The provisions of 37 CFR Sections 1.52 and 1.84 were developed for and are suitable for the specification and drawings of most patent applications. However, when lengthy computer program listings must be included in order to provide a complete disclosure, their presentation in the conventional manner can become burdensome.

The cost of printing long computer programs or routines in patent documents is very expensive to the Office. The issue fees for the applicant, which are based on the number of pages or sheets, are correspondingly high.

Proposed new Section 1.96 sets forth alternative methods for presentation of such listings. Under paragraph (a), relatively short computer program listings (10 printout pages or less) will be printed as part of the patent. Paragraph (b) provides for submitting computer program listings which are 51 or more paper pages in length in the form of microfiche as an appendix. Computer program listings 11–50 pages in length may be submitted under the provisions of either paragraphs (a) or (b). Appendices on microfiche will not be printed in the patent but will become publicly available on the date the patent is issued. After patenting, the appendix will be prior art under 35 U.S.C. 102(e) as of the filing date of the application with which it was filed. Various incorporations by reference have been approved by the courts in *General Electric Company* v. *Brenner*, 159 USPQ 335; In re Hawkins, 179 USPQ 157, and In re Argoudelis et al., 168 USPQ 99.

Copies of publicly available computer program listing appendices may be purchased either as microfiche (148 mm x 105 mm card) at $1.00 per microfiche or as printed out on paper copy 30¢ per page.

The micrographic standards referred to in proposed Section 1.96(b)(2) may be obtained from either the National Micrographic Association, 8728 Colesville Road, Silver Spring, Maryland 20910 or the American National Standards Institute, 1430 Broadway, New York, New York, 10018.

1. Section 1.21 is proposed to be amended by adding a new paragraph (1) to read as follows:

Section 1.21. *Patent and miscellaneous fees and charges.*

* * * * *

(1) The fee for obtaining a microfiche copy, per microfiche ---------- $1.00

* * * * *

2. Section 1.77 is proposed to be amended by revising paragraph (c) to read as follows:

Section 1.77. *Arrangement of application.*

* * * * *

(c) (1) Cross-reference to related applications, if any.

(2) Reference to material incorporated by reference, if any. (See Sections 1.96(b) and (c)).

* * * * *

3. A new Section 1.96 is proposed to be added which reads as follows:

Section 1.96. *Submission of computer program listings.*

Computer program listings may be submitted in the following forms:

(a) *As part of application which is to appear in the patent.* If the computer program listing is contained on 10 printout pages or less, it may be submitted either as drawings or as part of the specification.

(1) *Drawings.* The listing may be submitted in the manner and complying with the requirements for drawings as provided in Section 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) The listing may be submitted as part of the specification in accordance with the provisions of Section 1.52, at the end of the description but before the claims.

(ii) The listing may be submitted as part of the specification in the form of computer printout sheets commonly (11 by 14 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets must be original copies from the computer with dark solid black letters, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 11 inches wide, and the sheets should be submitted in a protective cover. When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will be reduced about ⅓ in size with two printout sheets being printed as one patent specification page. Any corrections must be made by way of substitute sheets.

(b) *As an appendix which will not be printed.* If a computer program listing printout is more than 51 pages long, applicants must submit such listing in the form of microfiche, referred to in the specifications. The microfiche filed with a patent application is referred to as an appendix. The microfiche appendix will not be part of the printed patent. Reference in the application to the appendix should be made at the location indicated in Section 1.77(c).

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public, and paper or microfiche copies will be available for purchase, after a patent is granted based on such an application. Any corrections must be made by way of revised microfiche.

(2) *Submission requirements.* Computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards set forth in National Micrographics Association (NMA) Standards—

MS1—Quality Standards for Computer Output Microfilm

MS2 (ANSI PH 5.18-1976)—Format and Coding Standards for Computer Output Microfilm

MS5 (ANSI PH 5.9-1975)—Microfiche of Documents

ANSI PH 2.19-1959—"Diffuse Transmission Density"—

except as modified or clarified below:

(i) Film submitted shall be first generation (camera film) negative appearing microfiche (wth emulsion on the back side of the film when viewed with the images right reading).

(ii) Either Computer-Output-Microfilm (COM output or copies of photographed paper copy may be submitted. In the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies.

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least .005 inches (0.13 mm) and not more than .009

inches (0.23 mm) for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most ⅛ (50 mm x 12 mm) of the header of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply serial number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application title together with inventor's name and any other bibliographic information the applicant sees fit to include. The final right-hand portion of the microfiche shall contain sequence information for the microfiche such as 1 of 4, 2 of 4, etc.

(vii) Additional requirements which supply specifically to microfiche of filmed paper copy or COM microfiche:

(a) Microfiche of filmed paper copy.

(1) The first frame of each microfiche submitted shall contain a standard NBS Microcopy Resolution Test Chart (No. 1010A).

(2) The second frame of each microfiche submitted must contain a fully descriptive title.

(3) The pages appearing on the microfiche frames should be consecutively numbered.

(4) Pagination of the microfiche frames shall be left to right and from top to bottom.

(5) At a reduction of 24 :1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduction copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.

(6) Background density of negative-appearing camera master microfiche of filmed paper documents shall be within the range 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19–1959.

(7) A suitable index should be included on each microfiche.

(b) Microfiche generated by COM.

(1) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.7 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH 2.19–1959.

(2) The first frame of each microfiche submitted shall contain a resolution test frame in conformance with NMA Standard MS1 (3.1.1).

(3) The second frame of each microfiche submitted must contain a fully descriptive title together with any other suitable index or other appropriate information.

(4) The pages appearing on the microfiche frames should be consecutively numbered.

(5) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, i.e., from top to bottom and from left to right, is also acceptable.

(c) *Optional use of either paragraph* (a) *or* (b). If the computer program listing is 11–50 pages long, applicants may utilize either the procedures of paragraph (a) or (b) of this section.

June 1, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved June 7, 1977.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 77–17030; Filed 6–14–77; 8:45 a.m.]
42 FR 30522, June 15, 1977

[960 O.G. 2]

(Pending—No Final Action Taken)

---

(56) PRACTICE RE: APPLICATIONS INVOLVING COMPUTER PROGRAMS

On November 18, 1976, the Court of Customs and Patent Appeals decided the cases of *In re Noll* and *In re Chatfield*. In both cases the Board of Appeals had taken the position that the claims were drawn to non-statutory subject matter under the Supreme Court's decision in *Gottschalk* v. *Benson*, 409 U.S. 63, 175 USPQ 673 (1972). The Noll application claims were drawn to an apparatus and the Chatfield application claims were drawn to a method.

The CCPA reversed the Board of Appeals in both cases. Until these decisions become final and since further review or clarification may be forthcoming, the patent examining corps will continue to examine computer programming applications in accordance with its current interpretation of the Supreme Court decision in the Benson case.

Prosecution will be resumed on all applications previously suspended under 37 CFR 1.103(b). No further programming applications will be suspended at the instance of the Office.

C. MARSHALL DANN,
Dec. 14, 1976. *Commissioner of Patents and Trademarks.*

[954 O.G. 550]

---

(57) PRIORITY CLAIMS BASED ON INVENTORS CERTIFICATES

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, applications for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 14]

(58) REQUIREMENTS FOR PRIORITY DOCUMENTS, PRIORITY BASED ON APPLICATION FOR INDUSTRIAL DESIGN

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

Aug. 15, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 O.G. 14]

(59) RIGHT OF PRIORITY (35 U.S.C. 119) BASED ON A FOREIGN APPLICATION FILED UNDER A BILATERAL OR MULTILATERAL TREATY

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

Aug. 9, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 O.G. 2]

(60) ABSTRACT OF THE DISCLOSURE

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster*, 512 F2d 676, 185 USPQ 152 (CCPA 1975). However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Dec. 30, 1977.

[967 O.G. 2]

(61) SUPPLEMENTAL GUIDELINES FOR THE IMPLEMENTATION OF 37 CFR 1.109—REASONS FOR ALLOWANCE

A recent review of recorded statements of reasons for allowance indicates the need for a better understanding regarding implementation of new Rule 109 (37 CFR 1.109).

These guidelines are supplemental to those published in the OFFICIAL GAZETTE at 957 O.G. 11 on April 12, 1977 and amplified in Section 1302.14 MPEP, Rev. 52, April 1977.

In determining whether reasons for allowance should be recorded the primary consideration lies in the first sentence of the Rule:

> "If the examiner believes that the record of the prosecution *as a whole* does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning." (Emphasis added.)

In most cases the examiner's actions and the applicant's response make evident the reasons for allowance, satisfying the "record as a whole" proviso of the rule. This is particularly true when applicant fully complies with 37 CFR 1.111 (b) and (c), 37 CFR 1.119 and 37 CFR 1.133(b). Thus where the examiner's actions clearly point out the reasons for rejection and the applicant's response explicitly represents reasons why claims are patentable over the reference, the reasons for allowance are in all probability evident from the record and no statement should be necessary. Conversely, where the record is not explicit as to reasons, but allowance is in order, then a logical extension of 37 CFR 1.111, 1.119

and 1.133 would dictate that the examiner should make reasons of record and such reasons should be specific.

Where specific reasons are recorded by the examiner, care must be taken to insure that such reasons are accurate, precise and do not place unwarranted interpretations, whether broad or narrow, upon the claims. The examiner should keep in mind the possible misinterpretations of his statement that may be made and its possible estoppel effects. Each statement should include at least: (1) the major difference in the claims not found in the prior art of record, and (2) the reasons why that difference is considered to define patentably over the prior art if either of these reasons for allowance is not clear in the record. The statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth.

Under the rule, the examiner must make a judgement of the individual record to determine whether or not reasons for allowance should be set out in that record. These guidelines, then, are intended to aid the examiner in making that judgement. They comprise illustrative examples as to applicability and appropriate content. They are not intended to be exhaustive.

Examples of When It Is Likely That a Statement Should Be Added to the Record

1. Claims are allowed on the basis of one (or some) of a number of arguments and/or affidavits presented and a statement is necessary to identify which of these were persuasive, for example:
   a. When the arguments are presented in an appeal brief.
   b. When the arguments are presented in an ordinary response with or without amendment of claims.
   c. When both an affidavit under 37 CFR 1.131 and arguments under 102 and 103 are presented.
2. First action issue:
   a. Of non-continuing application wherein claims are very close to cited prior art and differences have not been discussed elsewhere.
   b. Of continuing applications wherein reasons for allowance are not apparent from the record in the parent case or clear from preliminary filied matters.
3. Withdrawal of a rejection for reasons not suggested by applicant, for example:
   a. As a result of an appeal conference.
   b. When applicant's arguments have been misdirected or are not persuasive alone and the Examiner comes to realize that more cogent argument is available.
   c. When claims are amended to avoid a rejection under 35 USC 102 but arguments (if any) fail to address the question of obviousness.
4. Allowance after remand from the Board of Appeals.
5. Allowance coincident with the citation of newly found references that are very close to the claims, but claims are considered patentable thereover:
   a. When reference is found and cited (but not argued) by applicant.
   b. When reference is found and cited by Examiner.
6. Where the reasons for allowance *are* of record but in the Examiner's judgement, are unclear (e.g. spread throughout the file history) so that an unreasonable effort would be required to collect them.
7. Allowance based on claim interpretation which might not be readily apparent, for example:
   a. Article claims in which method limitations impart patentability.
   b. Method claims in which article limitations impart patentability.
   c. Claim is so drafted that "non-analogous" art is not applicable.
   d. Preamble or functional language "breathes life" into claim.

Examples of Statements of Suitable Content

1. The primary reason for allowance of the claims is the inclusion of .03 to .05 percent nickel in all the claims. Applicant's second affidavit, in example 5 shows unexpected results from this restricted range.
2. During two telephonic interviews with applicant's attorney, Mr. — on 5/6 and 5/10/77, the Examiner stated that Applicant's remarks about the placement of the primary teaching's grid member were persuasive, but he pointed out that applicant did not claim the member as being within the reactor. Thus, an amendment doing such was agreed to.
3. The instant application is deemed to be directed to an unobvious improvement over the invention patented in Pat. No. 3,953,224. The improvement comprises baffle means *12* whose effective length in the extraction tower may be varied so as to optimize and to control the extraction process.
4. Upon reconsideration, this application has been awarded the effective filing date of S.N. ————. Thus the rejection under 35 USC 102(d) and 103 over Belgian Patent No. 757,246 is withdrawn.
5. The specific limitation as to the pressure used during compression was agreed to during the telephone interview with applicant's attorney. During said interview, it was noted that applicants contended in their amendment that a process of the combined applied teachings could not result in a successful article within the amended pressure range. The Examiner agreed to rely on this statement (see page 3, bottom, of applicant's amendment), and the case was allowed.
6. In the Examiner's opinion, it would not be obvious to a person of ordinary skill in the art first to eliminate one of top members 4, second to eliminate plate 3, third to attach remaining member 4 directly to tube 2 and finally to substitute this modified handle for the handle 20 of Nania (see Fig. 1) especially in view of applicant's use of term "consisting."

Examples of Statements That Are Not Suitable as to Content

1. The 3 roll press couple has an upper roll 36 which is swingably adjustable to vary the pressure selectively against either of the two lower rolls. (NOTE: The significance of this statement may not be clear if no further explanation is given.)
2. The main reasons for allowance of these claims are applicant's remarks in the appeal brief and an agreement reached in the appeals conference.
3. The instant composition is a precursor in the manufacture of melamine resins. A thorough search of the prior art did not bring forth any compositions which corresponds to the instant compositions. The Examiner in the art also did not know of any art which could be used against the instant composition.
4. Claims 1–6 have been allowed because they are believed to be both novel and unobvious.

The examiner should *not* include in his statement any matter which does not relate directly to the reasons for allowance. For example:

5. Claims 1 and 2 are allowed because they are patentable over the prior art. If applicants are aware of better art than that which has been cited, they are required to call such to the attention of the Examiner.
6. The reference Jones discloses and claims an invention similar to applicant's. However, a comparison of the claims, as set forth below, demonstrates the conclusion that the inventions are non-interfering.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Jan. 24, 1978.

[968 O.G. 6]

---

(62) PRACTICE/RE: NEW GROUNDS OF REJECTION AFTER APPEAL BRIEF HAS BEEN FILED

A new practice has been implemented in the Patent Examining Corps to promote uniformity and adherence to guidelines in situations where a new ground of rejection is made in an Office action after an appeal brief has been filed. Under this practice Supervisory Patent Examiner approval is required for any new ground of rejection made after the filing of an Appeal Brief. This requirement extends to new grounds of re-

jection made either in an examiner's answer or in an Office action reopening prosecution. Evidence of that approval should appear on applicant's copy of the Office action or answer as well as the record copy. Consultation with or approval by the Group Director is no longer required in these situations.

This new practice does not alter the existing guidelines for reopening prosecution (MPEP) 706.7(e)) or for making a new ground of rejection in an examiner's answer (MPEP 1208.01). Appropriate modifications will be made to applicable Sections of the Manual of Patent Examining Procedure in a future revision.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[970 O.G. 94 (5-23-78)]

---

(63) COMMERCIAL SUCCESS AND OTHER CONSIDERATIONS BEARING ON OBVIOUSNESS

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are being made in the Manual of Patent Examining Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer*, 172 USPQ 126, 451 F.2d 1100 (CCPA 1971); *In re Fielder and Underwood*, 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro*, 425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin*, 448 F.2d. 791. 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate, to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli et al*, 176 USPQ 305, (CCPA 1973)]; [*In re Noznick et al*, 178 USPQ 43. (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America*, 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

July 10, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[973 O.G. 34]

---

(64) HANDLING OF DEPENDENT CLAIMS BY THE EXAMINER

Effective immediately, the following practice will be followed by patent examiners when making reference to a dependent claim—either singular or multiple. The new practice is intended to simplify and streamline our current practice (MPEP 608.01(n), Revision 55, January 1978) which experience indicates was unnecessarily burdensome in many cases.

1. When identifying a singular dependent claim which does not include a reference to a multiple dependent claim, either directly or indirectly, reference should be made only to the number of the dependent claim.
2. When identifying the embodiments included within a multiple dependent claim, or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, each embodiment should be identified by using the number of the claims involved, starting with the highest, *to the extent necessary* to specifically identify each embodiment.
3. When all embodiments included within a multiple dependent claim or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, are subject to a common rejection, objection or requirement, reference may be made only to the number of the dependent claim.

The following table illustrates the intended differences between current and the revised practice where each embodiment of each claim must be treated on an individual basis:

Claim Number	Claim Dependency	Identification: Current Practice	Identification: Revised Practice
1	Independent	1	1
2	Depends from 1	2/1	2
3	Depends from 2	3/2/1	3
4	Depends from 2 or 3	4/2/1	4/2
		4/3/2/1	4/3
5	Depends from 3	5/3/2/1	5
6	Depends from 2, 3 or 5	6/2/1	6/2
		6/3/2/1	6/3
		6/5/3/2/1	6/5
7	Depends from 6	7/6/2/1	7/6/2
		7/6/3/2/1	7/6/3
		7/6/5/3/2/1	7/6/5

When all embodiments in a multiple dependent claim situation (claims 4, 6 and 7 above) are subject to a common rejection, objection or requirement, reference may be made only to the number of the individual dependent claim. For example, if 4/2 and 4/3 were subject to a common ground of rejection, reference should be made only to claim 4 in the statement of that rejection.

The provisions of 35 USC 132 require that each Office action make it explicitly clear what rejection, objection and/or requirement is applied to each claim embodiment.

WILLIAM FELDMAN,
Oct. 17, 1978. *Deputy Assistant Commissioner.*

[976 O.G. 128]

MISCELLANEOUS

(65) HEARINGS BEFORE THE BOARD OF APPEALS

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been successful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of

1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Mar. 20, 1975.

[933 O.G. 1010]

---

(66) ACCESS TO INTERFERENCE SETTLEMENT AGREEMENTS BY GOVERNMENT AGENCIES

Under the provisions of 35 U.S.C. § 135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

Date: _____

To: Clerk, Board of Patent Interferences

Pursuant to the provisions of 35 USC 135(c), please permit _____,
the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. _____.
The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.

_____
Name, Title

_____
Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties or their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. § 1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

LUTRELLE F. PARKER,
Date: June 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[972 O.G. 2]

(67) ACCESSIBILITY OF NON-FINAL DISCOVERY OPINIONS AND ORDERS ISSUED BY THE BOARD OF PATENT INTERFERENCES

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

---

(68) EXTENSIONS OF TIME AND FILING OF PAPERS IN INTERFERENCES

A recent sample of the interferences declared during fiscal years 1971–1975 has shown that since the 1950–1959 period there has been an increase of 27 days in the approximately one and one-half year pendency time of the average interference. This increase has occurred in spite of the Commissioner's notice of April 24, 1964, 802 O.G. 601, and an extensive revision of the interference rules in 1965.

While the failure to achieve any reduction in average interference pendency time may in part be attributable to the adoption in 1971 of 37 CFR 1.287(a)(2), which provides for the setting of additional time periods for purposes of discovery, it appears that a considerable reduction would result if the parties were to adhere to the times originally set by the Office, rather than seeking extensions of those times. Accordingly, stipulations or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will

be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Another factor which adversely affects the pendency time of the average interference is the number of papers filed. While parties are certainly entitled to exercise their rights in filing papers provided for by the rules, many papers are also filed that are not provided for by the rules, such as replies to replies to oppositions to motions under 37 CFR 1.231, and replies to oppositions to motions or petitions under 37 CFR 1.243 or 1.244. These unprovided-for papers appear to be generally unnecessary, cause a considerable increase in the size of the interference files, and delay determination of the motions or petitions to which they relate. Therefore, in the future papers filed in interference proceedings will be given no consideration unless they are specifically provided for by the rules. In this regard, particular attention is directed to 37 CFR 1.228, 1.231(b), 1.237, 1.243 and 1.244.

C. MARSHALL DANN,
Nov. 9, 1976. *Commissioner of Patents and Trademarks.*

[953 O.G. 2]

---

(69) DISCLOSURE DOCUMENT PROGRAM

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and d wings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

---

(70) SUSPENSION OF ACTION *UNDER* 37 CFR 1.103 AND UNDER 37 CFR 1.212

The purpose of this notice is to clarify existing Office practice with respect to suspension of action.

"Suspension of action" under 37 CFR 1.103 applies only to the situation where action is to be taken *by the Examiner*. In other words, action cannot be suspended in an application which contains an outstanding Office action awaiting response by the applicant.

Under 37 CFR 1.212, upon declaration of an interference, ex parte prosecution of an application is suspended and any outstanding Office actions are considered as withdrawn by operation of the rule. *Ex parte Peterson*, 49 USPQ 119 (Commissioner of Patents, 1941). Upon termination of the interference, the Examiner will reinstate the action treated as withdrawn by operation of 37 CFR 1.212 and set a statutory period for response. The formats set forth in MPEP 1109.01 and MPEP 1109.02 may be followed.

Careful adherence to the distinction set forth above will prevent any question of abandonment from arising in connection with cases in which suspension of prosecution has occurred.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Mar. 7, 1978.

[969 O.G. 8]

(71)

POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.

ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.

ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.

BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.

BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.

CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.

CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.

CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.

CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.

CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.

COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.

DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.

DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.

DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.

DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.

HARTFORD, CONN. 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.

INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.

KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.

LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.

MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.

MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.

MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.

MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.

NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.

PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.

PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.

PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 886]

---

(72)

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries—Continued

The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patent may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

[974 O.G. 11]

---

(73) EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: " . . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205–12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appro-

priate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

---

(74) DEPARTMENT OF COMMERCE

[3510-16-M]

Patent and Trademark Office

[37 CFR Part 1]

ADVISORY OPINIONS ON VALIDITY OF PATENTS

Deferral of Rulemaking Proposal

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Deferral of rulemaking proposal.

SUMMARY: Patent and Trademark Office is deferring its rulemaking proposal concerning advisory opinions on patent validity. The public hearing is postponed until further notice.

DATES: Hearing scheduled for April 11, 1979 is postponed.

ADDRESS: Commissioner of Patents and Trademarks, Building 3, Room 11E10, Washington, D.C. 20231.

FOR FURTHER INFORMATION CONTACT:

Mr. Herbert C. Wamsley by telephone at (703) 557-3071, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: A notice of proposed rulemaking on advisory opinions on validity of patents was announced in the December 20, 1978 edition of the FEDERAL REGISTER (43 FR 59401). It also appeared in the January 4, 1979 issue of BNA's *Patent, Trademark and Copyright Journal* (410 PTCJ D-1), and in the January 16, 1979 edition of the Patent and Trademark Office's *Official Gazette* (978 O.G. 152). The date for the public hearing and the deadline for written comments were announced as April 11, 1979.

The Patent and Trademark Office has decided to delay consideration of this proposal. It would appear as though legislation may be introduced in the 96th Congress to establish a statutory procedure for reexamination of issued patents, perhaps including authority for the Office to use fees collected from the public to support the cost of reexamination. Accordingly, the present proposal may be unnecessary and therefore the public hearing is postponed until further notice. While members of the public are free to continue to submit written comments on the proposal, a further specific period for written comments will be set if the public hearing is rescheduled at a later date.

Dated: February 12, 1979.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:
Dated: February 16, 1979.
JORDAN J. BARUCH.
Assistant Secretary for Science and Technology.

[FR Doc. 79-5919 Filed 2-27-79; 8:45 am]

[987 O.G. 2]

PATENT COOPERATION TREATY

(75) PATENT COOPERATION TREATY: IMPLEMENTING LEGISLATION AND RATIFICATION

Public Law 94-131, as reprinted below, implements the Patent Cooperation Treaty (see Official Gazette, Volume 876, page 341; July 14, 1970) which was signed by the United States and 34 other countries in 1970. After enactment of the implementing legislation on November 14, 1975, the United States ratified the Treaty on November 26, 1975, thereby becoming the first country with major patent activity to do so. In accordance with the provisions of Article 63 of the Treaty, it enters into force three months after eight countries have adhered to it, four of which must have certain defined major patent activity.

Up to the time of United States ratification eight countries with only minor patent activity had adhered to the Treaty. Ratification by the United States, therefore, represents a significant step in the direction of bringing the Treaty into force. Other countries with major patent activity, and especially European countries, have been awaiting United States ratification before adhering themselves. Consequently, it is hoped that United States commitment to the Treaty has been demonstrated and will encourage adherence by other countries with major patent activity, thereby bringing into force a Treaty which would offer many advantages and benefits to patent applicants and patent offices alike. Because of the necessary action of other countries in bringing the Treaty into force, no exact date can be given at this time. It is presently estimated, however, that at least the necessary number of countries would be reached in Fiscal Year 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.
Date: Dec. 11, 1975.

Public Law 94-131
94th Congress, S. 24
November 14, 1975

An Act

To carry into effect certain provisions of the Patent Cooperation Treaty, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35, United States Code, entitled "Patents", be amended by adding at the end thereof a new part IV to read as follows:

Patent Cooperation Treaty.

"PART IV.—PATENT COOPERATION TREATY

"Chapter 35.—DEFINITIONS

"Sec.
"351. Definitions.

"§ 351. Definitions

35 USC 351.

"When used in this part unless the context otherwise indicates—

"(a) The term 'treaty' means the Patent Cooperation Treaty done at Washington, on June 19, 1970, excluding chapter II thereof.

"(b) The term 'Regulations', when capitalized, means the Regulations under the treaty excluding part C thereof, done at Washington on the same date as the treaty. The term 'regulations', when not capitalized, means the regulations established by the Commissioner under this title.

"(c) The term 'international application' means an application filed under the treaty.

"(d) The term 'international application originating in the United States' means an international application filed in the Patent Office when it is acting as a Receiving Office under the treaty, irrespective of whether or not the United States has been designated in that international application.

"(e) The term 'international application designating the United States' means an international application specifying the United States as a country in which a patent is sought, regardless where such international application is filed.

"(f) The term 'Receiving Office' means a national patent office or intergovernmental organization which receives and processes international applications as prescribed by the treaty and the Regulations.

"(g) The term 'International Searching Authority' means a national patent office or intergovernmental organization as appointed under the treaty which processes international applications as prescribed by the treaty and the Regulations.

"(h) The term 'International Bureau' means the international intergovernmental organization which is recognized as the coordinating body under the treaty and the Regulations.

"(i) Terms and expressions not defined in this part are to be taken in the sense indicated by the treaty and the Regulations.

"Chapter 36.—INTERNATIONAL STAGE

"Sec.
"361. Receiving Office.
"362. International Searching Authority.
"363. International application designating the United States: Effect.
"364. International stage: Procedure.
"365. Right of priority; benefit of the filing date of a prior application.
"366. Withdrawn international application.
"367. Actions of other authorities: Review.
"368. Secrecy of certain inventions; filing international applications in foreign countries.

35 USC 361.

"§ 361. Receiving Office

"(a) The Patent Office shall act as a Receiving Office for international applications filed by nationals or residents of the United States. In accordance with any agreement made between the United States and another country, the Patent Office may also act as a Receiving Office for international applications filed by residents or nationals of such country who are entitled to file international applications.

"(b) The Patent Office shall perform all acts connected with the discharge of duties required of a Receiving Office, including the collection of international fees and their transmittal to the International Bureau.

"(c) International applications filed in the Patent Office shall be in the English language.

"(d) The basic fee portion of the international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall be paid on filing of an international application. Payment of designation fees may be made on filing and shall be made not later than one year from the priority date of the international application.

Post, p. 690.

35 USC 362.

"§ 362. International Searching Authority

"The Patent Office may act as an International Searching Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau.

35 USC 363.

"§ 363. International application designating the United States: Effect

"An international application designating the United States shall have the effect, from its international filing date under article 11 of the treaty, of a national application for patent regularly filed in the Patent Office except as otherwise provided in section 102(e) of this title.

Post, p. 691.

35 USC 364.

"§ 364. International stage: Procedure

"(a) International applications shall be processed by the Patent Office when acting as a Receiving Office or International Searching Authority, or both, in accordance with the applicable provisions of the treaty, the Regulations, and this title.

"(b) An applicant's failure to act within prescribed time limits in connection with requirements pertaining to a pending international application may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the treaty and the Regulations, and provided the conditions imposed by the treaty and the Regulations regarding the excuse of such failure to act are complied with.

35 USC 365.

"§ 365. Right of priority; benefit of the filing date of a prior application

"(a) In accordance with the conditions and requirements of section 119 of this title, a national application shall be entitled to the right of

35 USC 119.

priority based on a prior filed international application which designated at least one country other than the United States.

"(b) In accordance with the conditions and requirement of the first paragraph of section 119 of this title and the treaty and the Regulations, an international application designating the United States shall be entitled to the right of priority based on a prior foreign application, or a prior international application designating at least one country other than the United States. 35 USC 119.

"(c) In accordance with the conditions and requirements of section 120 of this title, an international application designating the United States shall be entitled to the benefit of the filing date of a prior national application or a prior international application designating the United States, and a national application shall be entitled to the benefit of the filing date of a prior international application designating the United States. If any claim for the benefit of an earlier filing date is based on a prior international application which designated but did not originate in the United States, the Commissioner may require the filing in the Patent Office of a certified copy of such application together with a translation thereof into the English language, if it was filed in another language. Post, p. 692.

"§ 366. Withdrawn international application 35 USC 366.

"Subject to section 367 of this part, if an international application designating the United States is withdrawn or considered withdrawn, either generally or as to the United States, under the conditions of the treaty and the Regulations, before the applicant has complied with the applicable requirements prescribed by section 371(c) of this part, the designation of the United States shall have no effect and shall be considered as not having been made. However, such international application may serve as the basis for a claim of priority under section 365 (a) and (b) of this part, if it designated a country other than the United States. Infra.

"§ 367. Actions of other authorities: Review 35 USC 367.

"(a) Where a Receiving Office other than the Patent Office has refused to accord an international filing date to an international application designating the United States or where it has held such application to be withdrawn either generally or as to the United States, the applicant may request review of the matter by the Commissioner, on compliance with the requirements of and within the time limits specified by the treaty and the Regulations. Such review may result in a determination that such application be considered as pending in the national stage.

"(b) The review under subsection (a) of this section, subject to the same requirements and conditions, may also be requested in those instances where an international application designating the United States is considered withdrawn due to a finding by the International Bureau under article 12(3) of the treaty.

"§ 368. Secrecy of certain inventions; filing international applications in foreign countries 35 USC 368.

"(a) International applications filed in the Patent Office shall be subject to the provisions of chapter 17 of this title. 35 USC 181 et seq.

"(b) In accordance with article 27(8) of the treaty, the filing of an international application in a country other than the United States on the invention made in this country shall be considered to constitute the filing of an application in a foreign country within the meaning of chapter 17 of this title, whether or not the United States is designated in that international application.

"(c) If a license to file in a foreign country is refused or if an international application is ordered to be kept secret and a permit refused, the Patent Office when acting as a Receiving Office or International Searching Authority, or both, may not disclose the contents of such application to anyone not authorized to receive such disclosure.

"Chapter 37.—NATIONAL STAGE

"Sec.
"371. National stage: Commencement.
"372. National stage: Requirements and procedure.
"373. Improper applicant.
"374. Publication of international application: Effect.
"375. Patent issued on international application: Effect.
"376. Fees.

35 USC 371.

"§ 371. National stage: Commencement

"(a) Receipt from the International Bureau of copies of international applications with amendments to the claims, if any, and international search reports is required in the case of all international applications designating the United States, except those filed in the Patent Office.

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2) of the treaty, at which time the applicant shall have complied with the applicable requirements specified in subsection (c) of this section.

"(c) The applicant shall file in the Patent Office—

"(1) the national fee prescribed under section 376(a)(4) of this part;

"(2) a copy of the international application, unless not required under subsection (a) of this section or already received from the International Bureau, and a verified translation into the English language of the international application, if it was filed in another language;

"(3) amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent Office by the International Bureau, and a translation into the English language if such amendments were made in another language;

"(4) an oath or declaration of the inventor (or other person authorized under chapter 11 of this title) complying with the requirements of section 115 of this title and with regulations prescribed for oaths or declarations of applicants.

35 USC 111 et seq.
35 USC 115.

"(d) Failure to comply with any of the requirements of subsection (c) of this section, within the time limit provided by article 22 (1) or (2) of the treaty shall result in abandonment of the international application.

"(e) After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 of the treaty, except with the express consent of the applicant. The applicant may present amendments to the specification, claims, and drawings of the application after the national stage has commenced.

"(f) At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with.

"§ 372. National stage: Requirements and procedure 35 USC 372.

"(a) All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent Office.

"(b) In case of international applications designating but not originating in, the United States—

"(1) the Commissioner may cause to be reexamined questions relating to form and contents of the application in accordance with the requirements of the treaty and the Regulations;

"(2) the Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations. 35 USC 121.

"(c) Any claim not searched in the international stage in view of a holding, found to be justified by the Commissioner upon review, that the international application did not comply with the requirement for unity of invention under the treaty and the Regulations, shall be considered canceled, unless payment of a special fee is made by the applicant. Such special fee shall be paid with respect to each claim not searched in the international stage and shall be submitted not later than one month after a notice was sent to the applicant informing him that the said holding was deemed to be justified. The payment of the special fee shall not prevent the Commissioner from requiring that the international application be restricted to one of the inventions claimed therein under section 121 of this title, and within the scope of the requirements of the treaty and the Regulations.

"§ 373. Improper applicant 35 USC 373.

"An international application designating the United States, shall not be accepted by the Patent Office for the national stage if it was filed by anyone not qualified under chapter 11 of this title to be an applicant for the purpose of filing a national application in the United States. Such international applications shall not serve as the basis for the benefit of an earlier filing date under section 120 of this title in a subsequently filed application, but may serve as the basis for a claim of the right of priority under section 119 of this title, if the United States was not the sole country designated in such international application. 35 USC 111 et seq. Post, p. 692. 35 USC 119.

"§ 374. Publication of international application: Effect 35 USC 374.

"The publication under the treaty of an international application shall confer no rights and shall have no effect under this title other than that of a printed publication.

"§ 375. Patent issued on international application: Effect 35 USC 375.

"(a) A patent may be issued by the Commissioner based on an international application designating the United States, in accordance with the provisions of this title. Subject to section 102(e) of this title, such patent shall have the force and effect of a patent issued on a national application filed under the provisions of chapter 11 of this title. Post, p. 691.

"(b) Where due to an incorrect translation the scope of a patent granted on an international application designating the United States, which was not originally filed in the English language, exceeds the scope of the international application in its original language, a court of competent jurisdiction may retroactively limit the scope of the patent, by declaring it unenforceable to the extent that it exceeds the scope of the international application in its original language.

35 USC 376. **"§ 376. Fees**

"(a) The required payment of the international fee, which amount is specified in the Regulations, shall be paid in United States currency. The Patent Office may also charge the following fees:

"(1) A transmittal fee (see section 361(d));

"(2) A search fee (see section 361(d));

"(3) A supplemental search fee (to be paid when required);

"(4) A national fee (see section 371(c));

"(5) A special fee (to be paid when required; see section 372(c));

"(6) Such other fees as established by the Commissioner.

"(b) The amounts of fees specified in subsection (a) of this section, except the international fee, shall be prescribed by the Commissioner. He may refund any sum paid by mistake or in excess of the fees so specified, or if required under the treaty and the Regulations. The Commissioner may also refund any part of the search fee, where he determines such refund to be warranted.".

SEC. 2. Section 6 of title 35, United States Code, is amended by adding a paragraph (d) to read as follows:

35 USC 6. **"§ 6. Duties of Commissioner**

* * * * * * *

"(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.".

SEC. 3. Item 1 of section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 41. **"§ 41. Patent fees**

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design cases, $65; in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.".

Post, p. 691.

SEC. 4. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42. **"§ 42. Payment of patent fees; return of excess amounts**

"All patent fees shall be paid to the Commissioner who, except as provided in sections 361(b) and 376(b) of this title, shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.".

Ante, p. 686, Supra.

SEC. 5. Paragraph (e) of section 102 of title 35, United States Code, is amended to read as follows:

"§ 102. Conditions for patentability; novelty and loss of right to patent 35 USC 102.

* * * * * * *

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or".

SEC. 6. The first sentence of section 104 of title 35, United State Code, is amended to read as follows:

"§ 104. Invention made abroad 35 USC 104.

"In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.". 35 USC 119.

SEC. 7. The second sentence of the second paragraph of section 112 of title 35, United States Code, is amended to read as follows: Ante, p. 685.

"§ 112. Specification 35 USC 112.

* * * * * * *

"A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

"Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

"A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.".

SEC. 8. Section 113 of title 35, United States Code, is amended to read as follows:

"§ 113. Drawings 35 USC 113.

"The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented. When the nature of such subject matter admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof. Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.".

SEC. 9. Section 120 of title 35, United States Code, is amended to read as follows:

35 USC 120. **"§ 120. Benefit of earlier filing date in the United States**

"An application for patent for an invention disclosed in the manner
35 USC 112. provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section
Ante, p. 686. 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.".

SEC. 10. The first paragraph of section 282 of title 35, United States Code, is amended to read as follows:

35 USC 282. **"§ 282. Presumption of validity; defenses**

"A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.".

Effective dates. 35 USC 351 note. SEC. 11. (a) Section 1 of this Act shall come into force on the same day as the entry into force of the Patent Cooperation Treaty with respect to the United States. It shall apply to international and national applications filed on and after this effective date, even though entitled to the benefit of an earlier filing date, and to patents issued on such applications.

(b) Sections 2 to 10 of this Act shall take effect on the same day as section 1 of this Act and shall apply to all applications for patent actually filed in the United States on and after this effective date, as well as to international applications where applicable.

(c) Applications for patent on file in the Patent Office on the effective date of this Act, and patents issued on such applications, shall be governed by the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act.

Approved November 14, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-592 (Comm. on the Judiciary).
SENATE REPORT No. 94-215 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 121 (1975):
June 21, considered and passed Senate.
Nov. 3, considered and passed House.

(76) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Rule Promulgation Relating to Implementation of the Patent Cooperation Treaty

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the filing of United States national patent applications in the format required by the Patent Cooperation Treaty which entered into force on January 24, 1978. Some of these rule changes are necessary in order that international applications arriving for national examination in the United States Patent and Trademark Office as a Designated Office are formally acceptable. The changes also permit applicants for United States patents to file their United States national applications in the same format as that required by the Patent Cooperation Treaty, which is also the format required by the European Patent Convention. Other changes are made in the rules which relate to the filing of international and national applications.

DATES: Effective date, June 1, 1978. The amended rules apply to national and international applications filed on and after the effective date. It should be noted that international applications may be filed on and after June 1, 1978.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice promulgates a number of previously proposed rule changes relating to the filing of international applications under the Patent Cooperation Treaty and the filing of United States national applications which have the same format as international applications. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632-2644) and on February 8, 1977 in the Official Gazette (955 O.G. 350-363) of a proposal to amend Title 37 of the Code of Federal Regulations upon the entry into force of the Patent Cooperation Treaty and Public Law 94-131 (94th Congress; 89 Stat. 685). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the Official Gazette (960 O.G. 8). Twenty-four comments relevant to the proposed rule changes were received. The comments relating to the rules established in this notice are discussed in the commentary of the rules. A transcript of all comments presented by two persons at the oral hearing, and the written statements received are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. Some of the rules of the above-mentioned proposals, namely, sections 1.75, 1.81 and 1.83, have already been promulgated by the rule change which appeared in the Federal Register of January 31, 1978 at 43 FR 4014-4015 and on February 21, 1978 in the Official Gazette at 967 O.G. 12. This promulgation permits the filing of United States national applications in the same format as international applications and also makes a number of other changes in the rules.

Comments on Adopted Rules

No comments were received relating to sections 1.1, 1.4, 1.5, 1.8, 1.9, and 1.12. These sections are promulgated as proposed.

Section 1.14 received three comments. One letter suggested adding another paragraph (e) to mention that defense agencies are given access to applications relating to national security. Another letter indicated no objection to such an addition but did not consider it necessary. The first mentioned comment was not adopted since the proposed paragraph (e) would be restating a provision appearing in section 5.1(b). The third letter questioned whether the Patent and Trademark Office would supply a copy of the international application "pamphlet" after it was published. In response to this comment it should be noted that the Office will supply copies of the "pamphlet" at the regular price of 30¢ per page but that it will not give access to or supply copies of any pending national or international application without the written authorization of the applicant, assignee or attorney or agent of record. Paragraph (c) has been revised to refer to the Department of Energy which now has the pertinent responsibilities under the Atomic Energy Act.

Section 1.21 received one comment indicating that it was not clear whether the fee was required for both the international-type search and search report or only for the search report. The rule has been amended in order to clarify that the fee is required for the report only.

Sections 1.23 and 1.25 received no comments and are adopted as proposed.

Section 1.26 has been revised from the proposal by providing for only three choices as to refund rather than five. This change was made to simplify the determination of the amount of the refund, if any. In addition, the rounding of refunds was changed from the next higher multiple of $10 to the next higher multiple of $5 for greater preciseness.

Section 1.52 received one comment which proposed changing the wording of 1.52(c) to permit applicant's representative, as well as the applicant himself, to initial changes to application papers made before filing. Since no change in section 1.52(c) had been proposed, the suggested change is not required by the Patent Cooperation Treaty, the proposal is not being adopted in this promulgation.

Two comments were received noting that the proposed wording in section 1.55 did not distinguish between the prior art effective dates of international applications filed in the United States and those filed outside the United States. The proposed wording is correct since it corresponds with the language of 35 U.S.C. 102(e) as amended by Public Law 94-131.

Section 1.57 received two comments to the effect that applicants of international applications were given greater rights than national applicants since the proposed rule states that it is not required that the applicant of an international application have the oath or declaration attached to the specification at the time of signing. In response, it is acknowledged that the practice set forth in proposed section 1.57 is somewhat different for the two filing routes; however, the proposed wording follows the concepts set forth in 35 U.S.C. 371(c) as added by Public Law 94-131. Accordingly, no change is considered to be necessary or desirable.

One comment was received relating to section 1.58. The comment indicated the rule should relate only to complex chemical and mathematical formulas and tables. This comment has been adopted by revising section 1.58(c) to add the word "complex" before "formulas."

Section 1.61 received two comments from one person. The first comment relating to a question of where an international application would be examined for issuance, is not understood since international applications are not issued. However, since the comment did raise the matter of examination, a phrase has been added to indicate clearly that the requirements of section 1.61 must be followed if an examination for a U.S. patent is desired in an international application. The second comment indicated that there was no antecedent basis for the "mailing date of the declaration to the applicant." The declaration is clearly mentioned at the beginning of paragraph 1.61(b). The meaning of the mailing date of such a document to the applicant appears to be sufficently clear. No change is considered to be necessary in response to the second comment. In addition, numbers have been added to each of the listed items to improve readability.

Section 1.70 received two comments. Both related to providing uniformity between sections 1.65 and 1.70. It should be noted that section 1.65 was amended shortly after the time the proposal was published. Proposed section 1.70 has accordingly been amended to include the newly added wording of section 1.65. The wording of proposed section 1.70 has also been amended to provide for both genders.

Section 1.72 received no comments and is adopted as proposed.

One comment was submitted concerning section 1.77 which suggested that the rule specify that an attorney's docket number and the name of the inventor may be placed on the initial page of an application. Such a procedure is currently permitted, although not specifically mentioned in the rules. Since such data is not considered to be one of the application elements, the amendment of section 1.77 is not considered to be necessary. The rule is adopted as proposed.

No comments were received concerning section 1.78. This rule is adopted as proposed.

Section 1.84 relating to standards for drawings received four comments. One suggestion, not adopted, was that drawings on 8½ by 11 inch paper be permitted. Although this size is close to DIN size A4, the additional processing and printing problems which would result from three different paper sizes appear to be greater than the resulting benefits at this time. Some experience with the two sizes proposed is felt to be desirable before any additional alternatives are permitted. One comment proposed that this rule be adopted as early as possible. Since drawings under existing rules can also be prepared in a way which will later permit easy compliance with PCT requirements, it was considered unnecessary to adopt this suggestion. Two comments were received concerning the interpretation of paragraph (i). Although the wording of this paragraph is in substance the wording of PCT Rule 11.13(i), second sentence, it appears that some clarification is necessary. Therefore proposed paragraph (i) has been amended to clarify the intended requirements. The reference to blue ink in subparagraph (c) has been deleted since it has been deleted from the Treaty regulations.

Section 1.104 received one comment, which also related to section 1.21, to the effect that the proposed wording was not clear. The proposed section has been slightly revised and a note added for purpose of clarity. The preparation of a formal international-type search report is not required by the U.S. Patent and Trademark Office in order for the international-type search to serve as the basis for a search fee refund in a later international application.

Section 1.141 was commented upon by seven persons. The comments of several persons indicated that it appeared that paragraph 1.141(e) was unnecessary. This view is accepted; accordingly, paragraph 1.141(e) has been deleted from the promulgation. Another comment indicated that no need was seen to limit the wording of subparagraph (c) to only a few categories of claims. The treaty requires that the arrangements of claims described in (c), (i) and (ii) be considered as one invention, subject to the conditions stated in PCT Rule 13.2. It should be noted that proposed subparagraphs (c), (i) and (ii) are substantially a copy of PCT Rule 13.2. However, in view of this and other comments and for clarity, sections 1.141 and 1.146 and 1.481 and 1.482 have been substantially rewritten, amplified, and reorganized to clarify the meaning of certain terms, namely, "specially adapted" and "specifically designed", to conform more closely to current Office practice as set forth in MPEP sections 806.05(e)–(g). Both proposed rules 1.141 and 1.146 have been modified to clarify that the rules make little change in current restriction practice. The differences between the PCT unity of invention requirement and current restriction practice are minimal. The rewriting and reorganization of proposed sections 1.141 and 1.146 substantially states the current rule language except that the five species limitation is removed. Other comments indicated additional clarification of the other paragraphs would also be helpful. Such amendments have been made as mentioned.

Four comments were submitted relating to section 1.146. One comment received indicated that no reason was found in the PCT as to why an election of species is required regardless of whether or not there is an allowable generic claim. Although there is no reason in the PCT for such a requirement, the rule was amended to reflect current Office practice which in MPEP section 808.01(a) allows the examiner to require an election of species prior to the search. The second comment indicated a preference to maintain current restriction practice in all national applications which were not filed under the PCT route. This comment has been satisfied by the rewriting of the rules mentioned above. The third and fourth comments indicated that no need was seen to seek a requirement for restriction in all cases. These comments are similarly satisfied by the rewriting of the rules.

No comments were received concerning sections 1.318 and 1.331. These rules have been adopted as proposed.

Section 1.401 received no comments; however, "or" has been changed to—and—in subparagraph (a).

Section 1.412 was commented on by two persons. One comment suggested that a subparagraph (5) be added to refer to the licensing requirements of Part 5. This proposal has been adopted. The other comment considered the addition unnecessary.

Section 1.413 received no comments. However, the wording has been revised to provide for the United States Patent and Trademark Office to act as an International Searching Authority for other Receiving Offices subject to the approval of an agreement as such by the Commissioner. The name of the International Searching Authority has also been changed to follow the Administrative Instructions.

One comment we received relative to section 1.141 questioning the use of the word "will" in subparagraph (a). After review, no problem is seen with the proposed wording; therefore, no change is considered to be necessary.

Section 1.415 received no comments and is adopted as proposed.

Section 1.421 received comments from two persons. One comment is related to the requirement that the inventor must file the international application if patent protection is desired in the United States as a Designated State. This provision is set forth in 35 U.S.C. 373 and cannot be changed by modification of the rules. However, the rules, as proposed, have been amended and subparagraph (d) added to permit the attorney or agent to sign on behalf of the inventor. The other comment relates to the requirement that only nationals and residents of the United States can file in the United States Receiving Office. The requirement appears in 35 U.S.C. 361(a). As to the situation involving an invention made in this country by an inventor who is neither a resident nor national, such an inventor may file a regular U.S. national application or may obtain a license under 35 U.S.C. 184 to file in the foreign Receiving Office for the country of which the inventor is a resident or national.

No comments were received concerning sections 1.422, 1.423, 1.424 and 1.425. Except for the addition of one reference to the feminine gender, these rules are adopted as proposed.

Sections 1.431 and 1.432 were both the subject of a question as to whether the withdrawal of the international application would result in withdrawal of the national application. The withdrawal of the international application would result in the withdrawal of the designation of all States. If the United States was designated in an international application which was withdrawn before the requirements of 35 U.S.C. 371 were fulfilled, no processing of that withdrawn application would occur except as provided under PCT Article 25. These sections are adopted as proposed.

Section 1.433 received two comments, both related to the fact that the broad reference to PCT Rule 11 did not clearly indicate what size papers were required. This matter has been clarified in the promulgated rule to indicate that DIN A4 size sheets are required.

One comment was received concerning section 1.434 which correctly noted that the second arrow used to indicate additions in the proposal, should have been at the end of the paragraph.

No comments were received concerning sections 1.435, 1.437 and 1.438. These sections are adopted as proposed.

Section 1.436 has been amended to specifically include the requirement of PCT Rule 6.1(a), that the number of claims shall be reasonable.

Two comments were received relating to section 1.445 which indicated that the proposed fee amounts were too high. After review, it is felt that the fee amounts are set as required to cover 100% of the costs involved.

No comments were received concerning section 1.446; however, the number of refund choices has been reduced from 5 to 3 to simplify the determination choices.

No comments were received concerning section 1.451. Subparagraph (c) was amended to clarify the intent of the rule.

Section 1.455 received one comment which indicated that the expression "common representative" was not understood. This comment has been answered by adding a citation to PCT Rule 4.8, which explains the expression.

Section 1.461 received comments from four persons which proposed that a new subparagraph (c) be added which warns that a foreign filing license may be required to transmit a copy of the international application outside the United States. This suggestion has been adopted.

One comment relative to section 1.465 noted that the notation "PCT" was inadvertently omitted before a rule citation. This, along with a rule citation, have been corrected in the promulgation.

Section 1.468 received two comments, both related to problems raised by subparagraph (b). Upon reconsideration it appears that the broad language of subparagraph (a) and the reference to PCT Rule 82 is sufficient; accordingly, proposed subparagraph (b) has been deleted.

Section 1.471 received one comment which related to amendments at the national stage. Since this rule relates only to

international stage amendments, the rule is promulgated as proposed.

No comments were received relating to section 1.475; accordingly, the rule is promulgated as proposed.

Section 1.481 received one general comment which related to national practice rather than the international practice covered by this rule. However, changes were made in the proposed rules 1.481 and 1.482 to clarify them and make them more understandable. For one, it now makes clear that PCT Rule 13 is consistent with much of current practice under sections 1.141 and 1.146 with several exceptions specifically set out in section 1.481. The protest provisions have also been moved from section 1.481 to section 1.482 since the handling of protests is somewhat different subject matter than the other contents of section 1.481. In addition, subsection (c) of proposed section 1.482 was moved to section 1.481 where the subject matter is more pertinent. The other subsections of proposed subsection 1.482 were eliminated as unnecessary since they are part of existing practice and do not require inclusion in the rules specifically. The reference in section 1.481 to PCT Rule 13 in effect, includes these deleted subsections by reference.

A number of references to sections of the Administrative Instructions have been changed to reflect changes in the numbering of sections in the current version of the Administrative Instructions.

PART 3

Sections 3.56 and 3.57 received two comments. One comment essentially involved deleting the basic requirements of section 1.70. This proposal has not been adopted since it also affects section 1.65 and must be given careful study and an opportunity for comment allowed before any such change may be made. The other proposal indicated that the "duty of disclosure" provisions were not in these forms. The forms have been revised to include this duty.

PART 5

Section 5.1 received comments from two persons. Subparagraph (a) has been substantially rewritten to provide for filing of international applications in the United States Receiving Office without a license for foreign filing but for limiting the transmittal of the international application to a foreign national or international agency. Subparagraph (b) has been revised to refer to the Department of Energy.

Section 5.3 received comments from two persons which related to subparagraph (d). This subparagraph has been rewritten in view of the comments received.

Section 5.11 received comments from ten persons who all suggested that the rule be rewritten to permit the initial filing of an international application in the United States Receiving Office without a license. The rule has been rewritten in this manner.

Section 5.13 is amended due to a submitted proposal although the rule was not included in the proposed rule change notice. The changes made in section 5.13 follow the concepts suggested by numerous comments to section 5.11. Therefore, it is felt that the change can be made even though such a change was not proposed.

Section 5.14 received one comment as to possible processing problems but no suggestion was made; accordingly, the section is adopted as proposed.

Section 5.15 has been revised as suggested by two persons to refer to transmittal of the international application rather than filing thereof.

No comments were received relative to Section 5.17; this rule is adopted as proposed.

In a number of instances, references to the masculine gender have been deleted.

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement Under Executive Orders 11821 and 11949 and OMB Circular A-107.

The following table of contents indicates the contents of the promulgated subparts and the location of added sections and section headings.

PART I—RULES OF PRACTICE IN PATENT CASES
SUBPART A—GENERAL PROVISIONS
(§§ 1.1–1.26)
General Information and Correspondence

* * *

§ 1.9 Definitions.

SUBPART B—NATIONAL PROCESSING PROVISIONS
(§§ 1.31–1.352)

* * * * *

The Application

* * *

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Oath or Declaration

* * *

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

* * * * *

Allowance and Issue of Patent

* * *

§ 1.318 *Notification of national publication of a patent based on an international application*

* * * * *

SUBPART C—INTERNATIONAL PROCESSING PROVISIONS
(§§ 1.401–1.482)
General Information

§ 1.401 Definitions of terms under the Patent Cooperation Treaty.
§ 1.412 The United States Receiving Office.
§ 1.413 The United States International Searching Authority.
§ 1.414 The United States Designated Office.
§ 1.415 The International Bureau.

Who May File an International Application

§ 1.421 Applicant for international application.
§ 1.422 When the inventor is dead.
§ 1.423 When the inventor is insane or legally incapacitated.
§ 1.424 Joint inventors.
§ 1.425 Filing by other than inventor.

The International Application

§ 1.431 International application requirements.
§ 1.432 Designation of States and payment of designation fees.
§ 1.433 Physical requirements of international application.
§ 1.434 The Request.
§ 1.435 The description.
§ 1.436 The claims.
§ 1.437 The drawings.
§ 1.438 The abstract.

Fees

§ 1.445 International application filing and processing fees.
§ 1.446 Refund of international application filing and processing fees.

Priority

§ 1.451 The priority claim and priority document in an international application.

Representation

§ 1.455 Representation in international applications.

Transmittal of Record Copy

§ 1.461 Procedures for transmittal of record copy to the International Bureau.

Timing

§ 1.465 Timing of application processing based on the priority date.
§ 1.468 Delays in meeting time limits.

Amendments

§ 1.471 Corrections and amendments during international processing.

§ 1.475 Changes in person, name, or address of applicants and inventors.

Unity of Invention

§ 1.481 Determination of unity of invention before the International Searching Authority.
§ 1.482 Protest to lack of unity of invention.

PART 3—FORMS FOR PATENT CASES

• • •

§ 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).
§ 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

Accordingly, 37 CFR parts 1, 3 and 5 are amended as follows:

1. By revising § 1.1 to read as follows:

§ 1.1 *All communications to be addressed to Commissioner of Patents and Trademarks.*

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter should also be marked for the attention of a particular office or individual. Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to national and international patent cases except for provisions specifically directed to patent cases. See § 1.9 for definitions of "national application" and "international application."

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 *Nature of correspondence.*

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; and of Trademark applications §§ 2.11 to 2.189.

• • • • •

3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 *Identification of application, patent or registration.*

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

• • • • •

4. By revising paragraph (a)(1) and adding paragraph (xi) of § 1.8 to read as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of national applications for patent;

• • • • •

(xi) The filing of international applications for patent and papers relating thereto.

• • • • •

5. A new section 1.9 is added to read as follows:

§ 1.9 *Definitions.*

(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.

(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

6. By revising § 1.12 to read as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number or international application number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a Designated State in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

• • • • •

(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the Department of Energy, which Department will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by sections 151(c) and 151(d)

of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181 (c) and (d).

* * * * *

8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

* * * * *

(w) For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application... $25.00

NOTE: The Patent and Trademark Office does not require that a formal report be prepared of an international-type search in order to obtain a search fee refund in a later filed international application. For fees relating to processing of international applications, see § 1.445.

9. By revising § 1.23 to read as follows:

§ 1.23 *Method of payment.*

All payments of money required for Patent and Trademark Office fees, including fees for the processing of international applications (§ 1.445), should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 *Deposit accounts.*

* * * * *

(b) Filing, issue, appeal, international-type search report, international application processing, and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 *Refunds.*

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent examination of a national application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5, it will be rounded to the next higher multiple of $5. (Note § 1.446 for refund of the search fee in an international application.) Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of at least approximately one inch (2.5 cm.) must be reserved on the left-hand side of each page. The top of each page of the application, including claims must have a margin of at least approximately ¾ inch (2 cm.). The lines of text must not be crowded too closely together; type-written lines should be 1½ or double spaced. The pages of the application, including claims and abstract, should be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text.

* * * * *

13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 *Serial number and filing date of application.*

* * * * *

(d) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

14. By revising § 1.57 to read as follows:

§ 1.57 *Signature.*

(a) The application must be signed by the applicant in person. The signature to the oath or declaration under § 1.65 will be accepted as the signature to the application provided the oath or declaration under § 1.65 is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.

(c) Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables either if necessary to conform to 35 U.S.C. 112 or if otherwise found to be desirable.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, nonshiny and durable in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter, should be used to secure perfectly black solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (23.3 cm.) and to place it sideways on the sheet. Type-written characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 0.08 inch (2.1 mm.) high (e.g., elite type). Hand lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.). A space at least ¼ inch (6.4 mm.) high

should be provided between complex formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

§ 1.61 *Filing of applications in the United States of America as a Designated Office.*

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; (2) a verified translation of the international application and a translation of any amendments into the English language, if originally filed elsewhere in another language; (3) the national fee (see § 1.445(a)(4)); and (4) an oath or declaration of the inventor (see § 1.70).

(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.

17. By adding a new § 1.70 to read as follows:

§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371 (c)(4).*

(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must specifically identify the international application and any amendments thereto and state that he or she has reviewed the referred to application and any amendments, and that he or she verily believes himself or herself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he or she solicits a patent; that he or she does not know and does not believe that the same was ever known or used in the United States of America before his or her invention or discovery thereof, and shall state of what country he or she is a citizen and where he or she resides and whether he or she is a sole or joint inventor of the invention claimed in his or her international application as filed or as amended. In every application the applicant must distinctly state that to the best of his or her knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his or her international application, or patented or described in any printed publication in any country before his or her invention or more than one year prior to his or her international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his or her international application on an application filed by himself or herself or his or her legal representatives or assigns more than twelve months prior to his or her international application. He or she must acknowledge a duty to disclose information he or she is aware of which is material to the examination of the application. He or she shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself or herself, or by his or her legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he or she shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.

(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.

18. By revising paragraph (b) of § 1.72 to read as follows:

§ 1.72 *Title and abstract.*

* * * * *

(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably following the claims under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

19. By revising the text and heading of § 1.77 to read as follows:

§ 1.77 *Arrangement of application elements.*

The elements of the application should appear in the following order:

(a) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.
(b) (Reserved).
(c) Cross-references to related applications, if any.
(d) Brief summary of the invention.
(e) Brief description of the several views of the drawing, if there are drawings.
(f) Detailed description.
(g) Claim or claims.
(h) Signature. (See § 1.57).
(i) Abstract of the disclosure.
(j) Drawings.

20. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

When an applicant files an application claiming an invention disclosed in a prior filed copending national application or international application designating the United States of America of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications, if the benefit of the filing date of such prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

21. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon paper which is flexible, strong, white, smooth, non-shiny and durable. Two-ply or three-ply bristol board is preferred. The surface of the paper should be calendered and of a quality which will permit erasure and correction with India ink. India ink, or its equivalent in quality, is preferred for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not normally acceptable.

(b) *Size of sheet and margins.* The size of the sheets on which drawings are made may either be exactly 8½ by 14 inches (21.6 by 35.6 cm.) or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size. One of the shorter sides of the sheet is regarded as its top.

(1) On 8½ by 14 inch drawing sheets, the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of ¼ inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches (20.8 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight". The sheets may be provided with two ¼ inch (6.4 mm.) diameter holes having their centerlines spaced 11/16 inch (17.5 mm.) below the top edge and 2¾ inches (7.0

cm.) apart, said holes being equally spaced from the respective side edges.

(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be durable, black, sufficiently dense and dark, uniformly thick and well defined; the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid. Fine or crowded lines should be avoided. Solid black should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. (2) Heavy lines on the shade side of objects should preferably be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left-hand corner at an angle of 45°. Surface delineations should preferably be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They should not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines with the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.

• • • • •

(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plan, elevation, section, or perspective views, and detail views of portions of elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be understood by laying the drawing sheets adjacent to one another. The arrangement should be such that no part of any of the figures appearing on the various sheets are concealed and that the complete figure can be understood even though spaces will occur in the complete figure because of the margins on the drawing sheets. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet with the appropriate top margin is on the right-hand side. One figure must not be placed upon another or within the outline of another.

• • • • •

(l) *Extraneous matter.* Identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2¾ inches (7.0 cm.) in width may be placed in a centered location between the side edges within three-fourths inch (19.1 mm.) of the top edge. Authorized security markings may be placed on the drawings provided they are outside the illustrations and are removed when the material is declassified. Other extraneous matter will not be permitted upon the face of a drawing.

• • • • •

22. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

• • • • •

(c) An international-type search will be made in all national applications filed on and after June 1, 1978.

(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination on the merits, upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.

NOTE: The Patent and Trademark Office does not require that a formal report of an international-type search be prepared in order to obtain a search fee refund in a later filed international application.

23. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

(a) Two or more independent and distinct inventions, that is, inventions which do not form a single general inventive concept, may not be claimed in one application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

(b) A group of claims of different categories in an application so linked as to form a single inventive concept are considered to be one invention. In particular any of the following groupings of claims of different categories may be included in the same application:

(i) in addition to a claim for a given product, (a) a claim for one process specially adapted for the manufacture of the said product, as where the process of making as claimed cannot be used to make other and materially different products; (b) a claim for one use of the said product, as where said use as claimed cannot be practiced with another materially different product; or (c) both (a) and (b);

(ii) in addition to a claim for a given process, a claim for one apparatus or means specifically designed for carrying out of the said process, that is, it cannot be used to practice another materially different process.

(c) If the situation of subparagraph (1) of paragraph (b) of this section exists where claims to all three categories, product, process and use, are included, and the product claims

are not allowable, the use and process claims are not so linked as to form a single general inventive concept. Where the process and use claims are not so joined by an allowable linking product claim, the applicant will be required to elect either the use or the process for prosecution with the product claim.

24. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner may require the applicant in his response to that action to elect that species of his or her invention to which his or her claims shall be restricted if no generic claim is held allowable. However, if such application contains claims directed to more than a reasonable number of species, the examiner may require restriction of the claims to not more than a reasonable number of species before taking further action in the case.

25. By adding a new § 1.318 to read as follows:

§ 1.318 *Notification of national publication of a patent based on an international application.*

The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.

26. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America, will be recorded in the Patent and Trademark Office under 35 U.S.C. 261. Other instruments affecting title to a patent, a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or at the discretion of the Commissioner.

* * * * *

(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to a national application, or an international application which designates the United States of America should identify the application by serial number or international application number and date of filing (the name of the inventor and title of the invention as stated in the application should also be given), but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial number or international application number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention; so that there can be no mistake as to the patent or application intended.

Subpart C

27. By adding a new § 1.401 to read as follows:

§ 1.401 *Definitions of terms under the Patent Cooperation Treaty.*

(a) The abbreviation "PCT" and the term "Treaty" mean the Patent Cooperation Treaty.

(b) "International Bureau" means the World Intellectual Property Organization located in Geneva, Switzerland.

(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.

(d) "Request", when capitalized, means that element of the international application described in PCT Rules 3 and 4.

(e) "International application", as used in this Subchapter is defined in § 1.9(b).

(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.

(g) Other terms and expressions in this Subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.

28. By adding a new § 1.412 to read as follows:

§ 1.412 *The United States Receiving Office.*

(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.

(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."

(c) The major functions of the Receiving Office include:

(1) According of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) Assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11:

(3) Collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16);

(4) Transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23); and

(5) Determining compliance with applicable requirements of Part 5 of this chapter.

29. By adding a new § 1.413 to read as follows:

§ 1.413 *The United States International Searching Authority.*

(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applications filed in the United States Receiving Office and in other Receiving Offices as may be agreed upon by the Commissioner, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).

(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "United States International Searching Authority" or by the abbreviation "ISA/US."

(c) The major functions of the International Searching Authority include:

(1) Approving or establishing the title and abstract;

(2) Considering the matter of unity of invention;

(3) Conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33 to 45 and 47); and

(4) Transmitting the international search report to the applicant and the International Bureau.

30. By adding a new § 1.414 to read as follows:

§ 1.414 *The United States Designated Office.*

(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.

(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by abbreviation "DO/US."

(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) Receiving various notifications throughout the international stage;

(2) Accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371; and

(3) Conducting reviews under PCT Article 25 for those international applications declared withdrawn.

31. By adding a new § 1.415 to read as follows:

§ 1.415 *The International Bureau.*

(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations (PCT Art. 2 (xix) and 35 U.S.C. 351(h)).

(b) The major functions of the International Bureau include:

(1) Publishing of international applications and the International Gazette;

(2) Transmitting copies of international applications to Designated Offices;

(3) Storing and maintaining record copies; and

(4) Transmitting information to authorities pertinent to the processing of specific international applications.

32. By adding a new § 1.421 to read as follows:

§ 1.421 *Applicant for international application.*

(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.

(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.

(c) International applications which do not designate the United States of America may be filed by the assignee or owner.

(d) The attorney or agent of the applicant may sign the international application Request and file the international application for the applicant if the international application when filed is accompanied by a separate power of attorney to that attorney or agent from the applicant. The separate power of attorney from the applicant may be submitted after filing if sufficient cause is shown for not submitting it at the time of filing. Note that paragraph (b) of this section requires that the applicant be the inventor if the United States of America is designated.

(e) Any indication of different applicants for the purpose of different Designated Offices must be shown on the Request portion of the international application.

(f) Changes in the person, name, or address of the applicant of an international application shall be made in accordance with PCT Rule 18.5.

33. By adding a new § 1.422 to read as follows:

§ 1.422 *When the inventor is dead.*

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may file an international application which designates the United States of America.

34. By adding a new § 1.423 to read as follows:

§ 1.423 *When the inventor is insane or legally incapacitated.*

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may file an international application which designates the United States of America.

35. By adding a new § 1.424 to read as follows:

§ 1.424 *Joint Inventors.*

Joint inventors must jointly file an international application which designates the United States of America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.

36. By adding a new § 1.425 to read as follows:

§ 1.425 *Filing by other than inventor.*

(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself or herself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.

(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.

37. By adding a new § 1.431 to read as follows:

§ 1.431 *International application requirements.*

(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, an abstract, and one or more drawings (where required). (PCT Art. 3(2) and Section 207 of the Administrative Instruction.)

(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2);

(ii) the designation of at least one Contracting State of the International Patent Cooperation Union;

(iii) the name of the applicant, as prescribed (note § 1.422);

(iv) a part which on the face of it appears to be a description; and

(v) a part which on the face of it appears to be a claim.

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).

38. By adding a new § 1.432 to read as follows:

§ 1.432 *Designation of States and payment of designation fees.*

(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 201 of the Administrative Instructions.

(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).

39. By adding a new § 1.433 to read as follows:

§ 1.433 *Physical requirements of international application.*

(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(ii)) shall be filed in one copy only.

(b) All sheets of the international application must be on A4 size paper (21.0 x 29.7 cm.).

(c) Other physical requirements for international applications are set forth in PCT Rule 11 and Sections 201–207 of the Administrative Instructions.

40. By adding a new § 1.434 to read as follows:

§ 1.434 *The Request.*

(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request forms are available from the Patent and Trademark Office. Letters requesting such forms should be marked "Box PCT."

(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.

(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 110 and 201.

(d) International applications which designate the United States of America shall include:

(1) The name, address and signature of the inventor, except as provided by §§ 1.421(d), 1.422, 1.423 and 1.425;

(2) A reference to any copending national application or international application designating the United States of America, if the benefit of the filing date for the prior copending application is to be claimed.

41. By adding a new § 1.435 to read as follows:

§ 1.435 *The description.*

(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10 and 11 and Administrative Instruction 204, and shall be adhered to.

(b) In international applications designating the United States the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.

42. By adding a new § 1.436 to read as follows:

§ 1.436 *The claims.*

The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10 and 11 and shall be adhered to. The number of the claims shall be reasonable, considering the nature of the invention claimed.

43. By adding a new § 1.437 to read as follows:

§ 1.437 *The drawings.*

(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).

(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30-day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received, all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).

(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.

44. By adding a new § 1.438 to read as follows:

§ 1.438 *The abstract.*

(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.

(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.

45. By adding a new § 1.445 to read as follows:

§ 1.445 *International application filing and processing fees.*

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)------ $35.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)------ $300.00

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)--------- $200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)(1).

(5) A special fee when required (see 35 U.S.C. 372(c))------ $10.00 per claim.

(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.

46. By adding a new § 1.446 to read as follows:

§ 1.446 *Refund of international application filing and processing fees.*

(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.

(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search (PCT Rules 16 and 41). The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5.00, it will be rounded to the next higher multiple of $5.00. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.

(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commmissioner or the Commissioner's designee acting under PCT Rule 40.2(c).

(d) The international and search fees will be refunded if no international filing date is accorded (PCT Rules 15.6 and 16.2).

47. By adding a new § 1.451 to read as follows:

§ 1.451 *The priority claim and priority document in an international application.*

(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 110 and 201 of the Administrative Instructions.

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and 35 U.S.C. 41(11).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).

48. By adding a new § 1.455 to read as follows:

§ 1.455 *Representation in international applications.*

(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).

(b) Appointment of an agent, attorney or common representative (PCT Rule 4.8) must be effected either in the Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.

(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report.

(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.

49. By adding a new § 1.461 to read as follows:

§ 1.461 *Procedures for transmittal of record copy to the International Bureau.*

(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal personally shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office (PCT Rule 22).

(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.

(c) No copy of an international application may be transmitted to the International Bureau, a foreign Designated Office, or other foreign authority by the United States Receiving Office or the applicant, unless the applicable requirements of Part 5 of this chapter have been satisfied.

50. By adding a new § 1.465 to read as follows:

§ 1.465 *Timing of application processing based on the priority date.*

(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).

(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(b), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.

(c) When corrections under PCT Art. 11(2), Art. 14(2) or PCT Rule 20.2(a)(i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under PCT Rule 4.10(d).

51. By adding a new § 1.468 to read as follows:

§ 1.468 *Delays in meeting time limits.*

Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application, see § 1.137.

52. By adding a new § 1.471 to read as follows:

§ 1.471 *Corrections and amendments during international processing.*

(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).

(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.

53. By adding a new § 1.475 to read as follows:

§ 1.475 *Changes in person, name, or address of applicants and inventors.*

All requests for a change in person, name or address of applicants and inventor should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.

54. By adding § 1.481 to read as follows:

§ 1.481 *Determination of unity of invention before the International Searching Authority.*

(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13 and as set forth in §§ 1.141 and 1.146 except as modified below in this section.

(b) If the International Searching Authority considers that the international application does not comply with the requirements of unity of invention, it shall inform the applicant accordingly and invite the payment of additional fees (note § 1.445 and PCT Art. 17(3)(a) and PCT Rule 40). The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.

(c) In the case of non-compliance with unity of invention and where no additional fees are paid, the international search will be performed on the invention first mentioned ("main invention") in the claims.

(d) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention.

55. By adding § 1.482 to read as follows:

§ 1.482 *Protest to lack of unity of invention.*

(a) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, additional fees may be paid under protest, accompanied by a request for refund and a statement setting forth reasons for disagreement or why the required additional fees are considered excessive, or both (PCT Rule 40.2(c)).

(b) Protests under paragraph (c) of this section will be examined by the Commissioner or the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

(c) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the Designated Offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notification should be directed to the International Bureau (PCT Rule 40.2(c)).

56. By adding a new § 3.56 to read as follows:

§ 3.56 *Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number_____ _____ filed _____, and as amended on _____ (if any), which I have reviewed and for which I solicit a patent:

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowl-

edge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows:_____

_____

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

_____ }
_____ } ss:

Sworn to and subscribed before me this _____ day of _____, 19___.

_____

(Signature of notary or officer)

[SEAL]

_____

(Official character)

57. By adding a new § 3.57 to read as follows:

§ 3.57 *Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____

described and claimed in international application number _____ filed _____ and as amended on _____ (if any), which I have received and for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint Inventor, if any)

_____ Date _____

(Second Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

58. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office and, with respect to inventions made in the United States, to applications filed in any foreign country or any international authority other than the United States Receiving Office. The (1) filing of a national or an international application in a foreign country or with an international authority other than the United States Receiving Office, or (2) transmittal of an international application to a foreign agency or an international authority other than the United States Receiving Office is considered to be a foreign filing within the meaning of Chapter 17 of Title 35, United States Code.

(b) In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181–188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) all copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the Department of Energy as specified in § 1.14 of this chapter.

59. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) National applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be com-

pleted by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving national applications under secrecy order. However, if an applicant whose application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the national application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the national application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

(d) International applications under secrecy order will not be mailed, delivered or otherwise transmitted to the international authorities or the applicant. International applications under secrecy order will be processed up to the point where, if it were not for the secrecy order, record and search copies would be transmitted to the international authorities or the applicant.

60. Section 5.11 text and heading are revised to read as follows:

§ 5.11 *License for filing application in foreign country or for transmitting international application.*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, or transmitting an international application to any foreign patent agency or any international agency other than the United States Receiving Office, or causing or authorizing such filing or transmittal, with respect to an investment made in the United States, if:

(1) The foreign application is to be filed or its filing caused or authorized before a national or international application for patent is filed in the United States, or

(2) The foreign application is to be filed, or its filing caused or authorized, or the transmittal of the international application is caused or authorized, prior to the expiration of six months from the filing of the application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if:

(1) The invention was not made in the United States, or

(2) The foreign application is to be filed or the international application is to be transmitted, or its filing or transmittal caused or authorized, after the expiration of six months from the filing of the national application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country, nor can an international application be transmitted to any agency other than the United States Receiving Office except in accordance with § 5.5.

61. By revising text of heading of § 5.13 to read as follows:

§ 5.13 *Petition for license; no corresponding application.*

Where there is no corresponding national or international application, the petition for license must be accompanied by a legible copy of the material upon which license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition or requesting letter be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition. Where an international application is being filed in the United States Receiving Office, the petition may accompany the international application.

62. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

* * * * *

(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign or international application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed or transmitted abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency as it is to be filed in the Receiving Office must be furnished with the petition. If, however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

63. By revising § 5.15(a) to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country or transmit an international application to any foreign or international agency other than the United States Receiving Office, when granted, includes authority to forward all duplicate and formal papers to the foreign country or international agencies and to make amendments and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter. Any paper filed abroad or with an international agency following the filing of a foreign or international application which involves the disclosure of additional subject matter must be separately licensed in the same manner as a foreign or international application.

* * * * *

64. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign filing or international transmittal for or on behalf of the inventor or the inventor's assigns.

AUTHORITY: 35 U.S.C. 6, Public Law 94–131 (89 Stat. 685).

Date: April 25, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents, and Trademarks.

Approved: May 5, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[970 O.G. 100]

---

(77) PATENT COOPERATION TREATY (PCT) IMPLEMENTATION: INFORMATION FOR PROSPECTIVE APPLICANTS

International applications under the Patent Cooperation Treaty (PCT) may be filed with the Patent and Trademark Office beginning on 01 June 1978. In order to provide prospective applicants with information necessary for filing and to advise on the availability of various documents covering the requirements and procedures under the PCT, the following topics are included in this Notice:

I. Amendments to the Regulations under the Patent Cooperation Treaty.

II. Administrative Instructions under the Patent Cooperation Treaty.
III. Fees for the processing of International Applications.
IV. PCT Member States which may be designated in International Applications.
V. Availability of Documents concerning the Patent Cooperation Treaty.

A revision of pertinent parts of Title 37 of the Code of Federal Regulations incorporating changes necessary to implement the Patent Cooperation Treaty will be published in the near future.

TOPIC I: AMENDMENTS TO THE REGULATIONS UNDER THE PATENT COOPERATION TREATY (PCT)

The PCT Assembly at its first meeting on April 10–14, 1978 adopted several changes to the PCT Regulations. These changes are reproduced below so that prospective applicants who already have copies of the Treaty may incorporate the changes. To obtain copies of the Treaty, including the changes to the Regulations, see Topic V of this Notice.

AMENDMENTS TO THE REGULATIONS UNDER THE PATENT COOPERATION TREATY (PCT)

Adopted by the Assembly of the International Patent Cooperation (PCT) Union on April 14, 1978

TABLE OF AMENDMENTS

Rule 4.4(c)	Amended
Rule 4.10(d)	Amended
Rule 11.6(a)	Amended
Rule 11.6(b)	Amended
Rule 11.13(a)	Amended
Rule 15.2(a)	Amended
Rule 15.2(b)	Amended
Rule 32*bis*.1	New rule added
Rule 48.2(a)	Amended
Rule 48.3(c)	Amended
Rule 57.2(a)	Amended
Rule 57.2(b)	Amended
Rule 58.2	New rule added
Rule 58.3	New rule added
Rule 61.1(b)	Amended
Rule 74*bis*.1	New rule added
Rule 86.3(a)	Amended
Rule 86.3(b)	New rule added
Rule 86.4(a)	Amended
Rule 86.4(b)	New rule added

RULE 4

The Request (Contents)

4.4 *Names and Addresses*

(c) Addresses shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and, in any case, shall consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. It is recommended to indicate any telegraphic and teleprinter address and telephone number.

4.10 *Priority Claim*

(d) If the filing date of the earlier application as indicated in the request does not fall within the period of one year preceding the international filing date, the receiving Office, or, if the receiving Office has failed to do so, the International Bureau, shall invite the applicant to ask either for the cancellation of the declaration made under Article 8(1) or, if the date of the earlier application was indicated erroneously, for the correction of the date so indicated. If the applicant fails to act accordingly within 1 month from the date of the invitation, the declaration made under Article 8(1) shall be cancelled ex officio. The receiving Office effecting the correction or cancellation shall notify the applicant accordingly and, if copies of the international application have already been sent to the International Bureau and the International Searching Authority, that Bureau and that Authority. If the correction or cancellation is effected by the International Bureau, the latter shall notify the applicant and the International Searching Authority accordingly.

RULE 11

Physical Requirements of the International Application

11.6 *Margins*

(a) The minimum margins of the sheets containing the request, the description, the claims, and the abstract, shall be as follows:

top: 2 cm
left side: 2.5 cm
right side: 2 cm
bottom: 2 cm

(b) The recommended maximum, for the margins provided for in paragraph (a), is as follows:

top: 4 cm
left side: 4 cm
right side: 3 cm
bottom: 3 cm

11.13 *Special Requirements for Drawings*

(a) Drawings shall be executed in durable, black, sufficiently dense and dark, uniformly thick and well-defined, lines and strokes without colorings.

RULE 15

The International Fee

15.2 *Amounts*

(a) The amount of the basic fee shall be:

(i) if the international application contains not more than 30 sheets: US $165.00 or 300 Swiss francs.

(ii) if the international application contains more than 30 sheets: US $165.00 or 300 Swiss francs plus US $3.00 or 6 Swiss francs per sheet in excess of 30 sheets.

(b) The amount of the designation fee for each designated State or each group of designated States for which the same regional patent is sought shall be: US $40.00 or 80 Swiss francs.

RULE 32*bis*

Withdrawal of the Priority Claim

32*bis*.1 *Withdrawals*

(a) The applicant may withdraw the priority claim made in the international application under Article 8(1) at any time before the international publication of the international application.

(b) Where the international application contains more than one priority claim, the applicant may exercise the right provided for in paragraph (a) in respect of one or more or all of them.

(c) Where the withdrawal of the priority claim, or, in the case of more than one such claim, the withdrawal of any of them, causes a change in the priority date of the international application, any time limit which is computed from the original priority date and which has not already expired shall be computed from the priority date resulting from that change. In the case of the time limit of 18 months referred to in Article 21(2)(a), the International Bureau may nevertheless proceed with the international publication on the basis of the said time limit as computed from the original priority date if the withdrawal is effected during the period of 15 days preceding the expiration of that time limit.

(d) For any withdrawal under paragraph (a), the provisions of Rule 32.1(c) and (d) and Rule 74*bis*.1 shall apply *mutatis mutandis*.

RULE 48

International Publication

48.2 *Contents*

(a) The pamphlet shall contain:

(i) a standardized front page,
(ii) the description,
(iii) the claims,
(iv) the drawings, if any,
(v) subject to paragraph (g), the international search report or the declaration under Article 17(2)(a); the publication of the international search report in the pamphlet shall, however, not be required to include the part of the international search report which contains only matter referred to in Rule 43 already appearing on the front page of the pamphlet,

(vi) any statement filed under Article 19(1), unless the International Bureau finds that the statement does not comply with the provisions of Rule 46.4.

48.3 *Language*

(c) If the international application is published in a language other than English, the international search report to the extent that it is published under Rule 48.2(a)(v), or the declaration referred to in Article 17(2)(a), and the abstract shall be published both in that language and in English. The translations shall be prepared under the responsibility of the International Bureau.

RULE 57

The Handling Fee

57.2. *Amount*

(a) The amount of the handling fee shall be US $50.00 or 96 Swiss francs augmented by as many times the same amount as the number of languages into which the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau.

(b) Where, because of a later election or elections, the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau into one or more additional languages, a supplement to the handling fee shall be payable and shall amount to US $50.00 or 96 Swiss francs for each additional language.

RULE 58

The Preliminary Examination Fee

58.2 *Failure to pay*

(a) Where the preliminary examination fee fixed by the International Preliminary Examining Authority under Rule 58.1(b) is not paid as required under that Rule, the International Preliminary Examining Authority shall invite the applicant to pay the fee or the missing part thereof within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the preliminary examination fee will be considered as if it had been paid on the due date.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the demand shall be considered as if it had not been submitted.

58.3 *Refund*

The International Preliminary Examining Authorities shall inform the International Bureau of the extent, if any, to which, and the conditions, if any, under which, they will refund any amount paid as a preliminary examination fee where the demand is considered as if it had not been submitted under Rule 57.4(c), Rule 58.2(c) or Rule 60.1(c), and the International Bureau shall promptly publish such information.

RULE 61

Notification of the Demand and Elections

61.1 *Notifications to the International Bureau, the Applicant, and the International Preliminary Examining Authority*

(b) The International Preliminary Examining Authority shall promptly inform the applicant in writing of the date of receipt of the demand. Where the demand has been considered under Rules 57.4(c), 58.2(c) or 60.1(c) as if it had not been submitted, the International Preliminary Examining Authority shall notify the applicant accordingly.

RULE 74bis

Notification of Withdrawal under Rule 32

74bis.1 *Notification of the International Preliminary Examining Authority*

If, at the time of the withdrawal of the international application or of the designation of all designated States under Rule 32.1, a demand for international preliminary examination has already been submitted and the international preliminary examination report has not yet issued, the International Bureau shall promptly notify the fact of withdrawal, together with the date of receipt of the notice effecting withdrawal, to the International Preliminary Examining Authority.

RULE 86

The Gazette

86.3 *Frequency*

(a) Subject to paragraph (b), the Gazette shall be published once a week.

(b) For a transitional period after the entry into force of the Treaty terminating upon a date fixed by the Assembly, the Gazette may be published at such times as the Director General considers appropriate having regard to the number of international applications and the amount of other material required to be published.

86.4 *Sale*

(a) Subject to paragraph (b), the subscription and other sale prices of the Gazette shall be fixed in the Administrative Instructions.

(b) For a transitional period after the entry into force of the Treaty terminating upon a date fixed by the Assembly, the Gazette may be distributed on such terms as the Director General considers appropriate having regard to the number of international applications and the amount of other material published therein.

TOPIC II: ADMINISTRATIVE INSTRUCTIONS UNDER THE PATENT COOPERATION TREATY

The Administrative Instructions have been established under Article 58(4) and Rule 89 of the Patent Cooperation Treaty by the Director General of the World Intellectual Property Organization and will enter into force on 01 June 1978. The Administrative Instructions comprise 6 parts and a number of Annexes which provide instructions on various processing requirements that are not covered in detail in the Treaty or its Regulations.

A draft of the Administrative Instructions was published in the January 25, 1977 issue of the OFFICIAL GAZETTE (954 O.G. 4, 1362–1411). A number of changes to that draft version have been made and appear in the established final version printed in this Notice. Among these changes are included a renumbering of many sections, establishment of final wording for sections that were marked in the draft as tentative, and changes in the Request and International Search Report forms.

The Administrative Instructions printed in this Notice contain the entirety of Parts 1–6, and the full text of Annexes A–E. Annex F, which contains model copies of all forms for use by International Authorities (over 300 pages), has not been reproduced in full. However, that portion of Annex F containing copies of the four printed forms for use by applicants and Authorities has been reproduced.

From time to time the Administrative Instructions will be amended. Such amendments, and their effective dates, will be published in the OFFICIAL GAZETTE. For the availability of individual copies of the Administrative Instructions and the Request form see Topic V of this Notice.

ADMINISTRATIVE INSTRUCTIONS UNDER THE PATENT COOPERATION TREATY (PCT)

TABLE OF CONTENTS

Part 1: Instructions Relating to General Matters

Section 101: Abbreviated Expressions
Section 102: Use of the Forms
Section 103: Languages of the Forms
Section 104: Language of Correspondence from the Applicant
Section 105: Several Applicants
Section 106: Common Agent for Several Applicants
Section 107: Identification of International Authorities
Section 108: Correspondence Intended for the Applicant
Section 109: Notification of Authorization or Refusal of Rectification
Section 110: Dates

Part 2: Instructions Relating to the International Application

Section 201: Names of States; Cancellation of Designations
Section 202: Kind of Protection
Section 203: Regional Patents
Section 204: Headings of the Parts of the Description
Section 205: Numbering of Claims upon Amendment
Section 206: Common Representative Designated in the Request
Section 207: Arrangement of Elements and Numbering of Sheets of the International Application

Part 3: Instructions Relating to the Receiving Office

Section 301: Notification of Receipt of Purported International Application
Section 302: Notification of Priority Claim Considered Not To Have Been Made
Section 303: Deletion of Additional Matter in the Request
Section 304: Corrections Submitted to the Receiving Office Concerning Expressions, Etc., Not To Be Used in the International Application
Section 305: Identifying the Copies of the International Application
Section 306: Change in the Person, Name or Address of the Applicant
Section 307: System of Numbering International Applications
Section 308: Marking of the Sheets of the International Application
Section 309: Procedure in the Case of Later Submitted Sheets
Section 310: Procedure in the Case of Missing Drawings
Section 311: Renumbering of Sheets of the International Application
Section 312: Notification of Decision Not To Issue Declaration that the International Application is Considered Withdrawn
Section 313: Manner of Making the Necessary Annotations in the Check List
Section 314: Manner of Indicating Correction of the Priority Date or Cancellation of the Priority Claim
Section 315: Notification of Non-Collection of Record Copy
Section 316: Procedure in the Case Where the International Application Lacks the Prescribed Signature

Part 4: Instructions Relating to the International Bureau

Section 401: Marking of Sheets of the Record Copy
Section 402: Notification of Correction of the Priority Date or Cancellation of the Priority Claim
Section 403: Transmittal of Protest Against Payment of Additional Fee and Decision Thereon
Section 404: International Publication Number
Section 405: Special Publication Fee
Section 406: Pamphlets
Section 407: The Gazette
Section 408: Priority Application Number
Section 409: Notifications of Priority Claim Considered Not To Have Been Made
Section 410: Numbering of Sheets of the International Application For Purposes of International Publication
Section 411: Notification that the Certified Copy of the Priority Document Has Not Been Submitted

Part 5: Instructions Relating to the International Searching Authority

Section 501: Corrections Submitted to the International Searching Authority Concerning Expressions, Etc., Not To Be Used in the International Application
Section 502: Protest Against Payment of Additional Fee and Decision Thereon
Section 503: Method of Identifying Documents Cited in the International Search Report
Section 504: Classification of the Subject Matter of the International Application
Section 505: Indication of Citations of Particular Relevance in the International Search Report
Section 506: Comments on Draft Translation of the International Application
Section 507: Manner of Indicating Certain Special Categories of Documents Cited in the International Search Report
Section 508: Manner of Indicating the Claims to which the Documents Cited in the International Search Report are Relevant

Part 6: Instructions Relating to the International Preliminary Examining Authority

Section 601: Determination Whether Applicant is Entitled To Make a Demand
Section 602: Marking of Replacement Sheets and Renumbering of Sheets of the International Application
Section 603: Transmittal of Protest Against Payment of Additional Fee and Decision Thereon
Section 604: Guidelines for Explanations Contained in the International Preliminary Examination Report

Annex A: Names of States (Members of the Paris Union)
Annex B: Code for Identifying States and Organizations
Annex C: Standard Code for Identification of Different Kinds of Patent Documents
Annex D: Information from Pamphlet Front Page To Be Included in the Gazette under Rule 86.1(i)
Annex E: Information To Be Published in the Gazette under Rule 86.1(v)
Annex F: Forms

PART 1

INSTRUCTIONS RELATING TO GENERAL MATTERS

Section 101

Abbreviated Expressions

In these Administrative Instructions:

(i) "Treaty" means the Patent Cooperation Treaty;

(ii) "Regulations" means the Regulations under the Treaty;

(iii) "Article" means an Article of the Treaty;

(iv) "Rule" means a Rule of the Regulations;

(v) "International Bureau" means the International Bureau as defined in Article 2 (xix) of the Treaty;

(vi) "International Authorities" means the receiving Offices, the International Searching Authorities, the International Preliminary Examining Authorities, and the International Bureau.

Section 102

Use of the Forms

(a) The forms annexed to these Administrative Instructions as *Annex F** (hereinafter referred to as "the Forms") are part of these Administrative Instructions.

(b) Subject to paragraph *(c)*, the International Authorities shall use, or require the use of, the mandatory forms specified below:

Forms Required to be Printed under, or Otherwise Provided for, in the Regulations

PCT/RO/101 — Request (including the fee calculation sheet annexed thereto)
PCT/ISA/210 — International Search Report
PCT/IPEA/401 — Demand
PCT/IPEA/409 — International Preliminary Examination Report

Forms for Use by the International Bureau

Forms PCT/IB/301 to 345, with the exception of Form PCT/IB/328.

---

* This Annex is published separately; it may be obtained from the International Bureau, upon request, at a price of 40 Swiss francs.

Other Forms

PCT/RO/103**	PCT/ISA/201**	PCT/IPEA/405**
PCT/RO/104*	PCT/ISA/202*	PCT/IPEA/407*
PCT/RO/106*	PCT/ISA/203*	PCT/IPEA/408**
PCT/RO/109*	PCT/ISA/205*	PCT/IPEA/410*
PCT/RO/111*	PCT/ISA/206**	PCT/IPEA/412*
PCT/RO/112*	PCT/ISA/209*	PCT/IPEA/414*
PCT/RO/113*	PCT/ISA/212**	PCT/IPEA/415*
PCT/RO/114*	PCT/ISA/214*	PCT/IPEA/418*
PCT/RO/115**	PCT/ISA/215*	PCT/IPEA/419*
PCT/RO/116*	PCT/ISA/217*	PCT/IPEA/420**
PCT/RO/117*	PCT/ISA/218*	
PCT/RO/118*	PCT/ISA/219*	
PCT/RO/121*		
PCT/RO/123*		
PCT/RO/129*		
PCT/RO/130*		

(c) The obligation of the International Authorities to use, or require the use of, the mandatory Forms is subject to the following provisos:

(i) slight variations in layout necessary in view of the printing of such Forms in various languages are permitted;

(ii) in all Forms, other than those for the request, the international search report, the demand and the international preliminary examination report, slight variations in layout, to the extent necessary to meet the particular office requirements of the International Authorities, are permitted as well;

(iii) where the receiving Office, the International Searching Authority and/or the International Preliminary Examining Authority are each part of the same Office, the obligation to use the mandatory Forms does not extend to communications within that same Office;

(iv) the annexes to Forms PCT/RO/106, PCT/ISA/215 and PCT/IB/313 may be omitted in cases where they are not used;

(v) the mandatory character of the Forms referred to in paragraph *(b)* does not extend to the Notes attached to them.

(d) The use of Forms annexed to these Administrative Instructions other than those referred to in paragraph *(b)* is optional.

Section 103

Languages of the Forms

(a) The language of the Forms used by any receiving Office shall be the same as the language in which the international application is filed, provided that the receiving Office may, in its communications to the applicant, use any other language being one of its official languages.

(b) The language or languages of the Forms to be used by any International Searching Authority shall be specified in the applicable agreement referred to in Article 16(3)*(b)*.

---

* Forms for use by receiving Offices, International Searching Authorities and International Preliminary Examining Authorities.

** Forms sent to applicants, on matters subject to review or further processing by International Authorities.

(c) The language or languages of the Forms to be used by any International Preliminary Examining Authority shall be specified in the applicable agreement referred to in Article 32(3).

(d) The language of any Form used by the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language of any Form used by the International Bureau in its communications to any other International Authority shall be English or French according to the wishes of such Authority, and in its communications to the applicant it shall be English or French according to the wishes of the applicant.

Section 104

Language of Correspondence from the Applicant

(a) The language of any letter from the applicant to the receiving Office shall be the same as the language of the international application to which such letter relates. However, the receiving Office may expressly authorize the use of any other language.

(b) The language of any letter from the applicant to the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language of any letter from the applicant to the International Bureau shall be English or French at the choice of the applicant.

Section 105

Several Applicants

Where any international application indicates as applicants several persons, it shall be sufficient, for the purpose of identifying that application, to indicate, in any Form or correspondence relating to such application, the name of the applicant first named in the request.

Section 106

Common Agent for Several Applicants

In the case of several applicants, any agent designated under Rule 4.7 in the request signed by all the applicants, or appointed under Rule 90.3 in a separate power of attorney signed by all the applicants, shall be considered a common agent.

Section 107

Identification of International Authorities

(a) Whenever the nature of any communication from or to the applicant or from or to any International Authority so permits, any International Authority may be indicated in the communication by the two-letter code as appearing in *Annex B*.

(b) Where the International Authority is a receiving Office, an International Searching Authority or an International Preliminary Examining Authority, indication thereof shall be preceded by the letters "RO," "ISA," or "IPEA," respectively, followed by a slant (e.g., "RO/JA," "ISA/US," "IPEA/SU").

Section 108

Correspondence Intended for the Applicant

(a) Any correspondence from an International Authority intended for the applicant, or, in the case of several applicants, the applicants, shall be addressed as follows:

(i) Where the applicant has designated or appointed one agent, correspondence shall be addressed to that agent. Where, in the case of several applicants, the applicants are represented by a common representative or a common agent, correspondence shall be addressed to that representative or that agent.

(ii) Where the applicant has designated several agents in the request, correspondence shall be addressed to the agent first mentioned therein. Where, in the case of several applicants, the applicants have designated several common agents in the request, correspondence shall be addressed to the common agent first mentioned therein.

(iii) Where the applicant has appointed several agents in one or more separate powers of attorney, correspondence shall be addressed to the agent first mentioned in the earliest filed and still valid separate power of attorney. Where, in the case of several applicants, the applicants have appointed several common agents in one or more separate powers of attorney, correspondence shall be addressed to the common agent first mentioned in the earliest filed and still valid separate power of attorney.

(b) Any correspondence from an International Authority to the applicant or his agent shall be marked with the file reference, composed either of letters or numbers, or both, of the applicant or the agent, if so indicated on the request Form, provided this reference does not exceed ten characters.

Section 109

Notification of Authorization or Refusal of Rectification

Any International Authority which authorizes or refuses rectification of obvious errors of transcription under Rule 91 shall promptly inform the applicant of such authorization or refusal and, in the case of refusal, of the reasons therefor.

Section 110

*Dates**

Any date in the international application, or used in any correspondence emanating from International Authorities relating to the international application, shall be indicated by the Arabic number of the day, by the name of the month, and by the Arabic number of the year. The receiving Office, where the applicant has not done so, or the International Bureau, where the applicant has not done so and the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by two-digit Arabic numerals each for the number of the day, for the number of the month and for the last two numbers of the year, in that order and with a period after the digit pairs of the day and of the month (for example, "30 March 1978 (30.03.78)").

---

* This system of indication of dates is based on the ICIREPAT standards whereas the ISO standards provide for the reverse sequence of data. If the use of the ISO standards should become more common practice in the industrial property field, this Section will be reviewed.

PART 2

INSTRUCTIONS RELATING TO THE INTERNATIONAL APPLICATION

Section 201

Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appears in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appears in *Annex B* (for example, where France is the third designated State in Box V of the request Form, "FR 3. France" or "FR 3. French Republic").

(b) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action.

Section 202

Kind of Protection

(a) Where the applicant wishes his application to be treated in any designated State as an application not for a patent but for the grant of another kind of protection referred to in Article 43, he shall make the indication in the request referred to in Rule 4.12*(a)* by inserting the words "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition" or "utility certificate of addition," or their equivalent in the language of the international application, immediately after the indication of the said State.

(b) Where the applicant is seeking two kinds of protection under Article 44, he shall make the indication in the request referred to in Rule 4.12*(b)* by inserting, immediately after the indication of the said State and in the language of the international application, either,

(i) any two of the following terms connected by the word "and": "patent," "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition," "utility certificate of addition;" or

(ii) any two of the terms indicated in (i) above, one of them preceded by the word "primarily" and the other by the word "subsidiarily."

Section 203

Regional Patents

Where the applicant wishes to obtain a regional patent in respect of any designated State, he shall make the indication in the request referred to in Rule 4.1*(b)* (iv) by inserting the words "regional patent," or their equivalent in the language of the international application, immediately after the indication of the said State or, where an indication has been made under Section 202, after that indication, provided that:

(i) where Article 4(1) (ii), third clause applies, and not all the States party to the regional treaty have been designated, the international application shall be treated as if all those States had

been designated and as if the designations of all such States contained the said words, whether the said designations contained an indication of the wish to obtain a regional patent or, according to Article 4(1) (ii), fourth clause, are to be treated as containing such indication;

(ii) where the national law of any designated State contains a provision as referred to in Article 45(2), the International Bureau shall, according to Article 4(1)(ii), fourth clause, treat the designation as if it contained the said words even where the applicant failed to indicate them.

Section 204

Headings of the Parts of the Description

The headings referred to Rule 5.1*(c)* should be as follows:

(i) for matter referred to in Rule 5.1*(a)*(i), "Technical Field;"

(ii) for matter referred to in Rule 5.1*(a)*(ii), "Background Art;"

(iii) for matter referred to in Rule 5.1*(a)*(iii), "Disclosure of Invention;"

(iv) for matter referred to in Rule 5.1*(a)*(iv), "Brief Description of Drawings;"

(v) for matter referred to in Rule 5.1*(a)*(v), "Best Mode for Carrying Out the Invention;"

(vi) for matter referred to in Rule 5.1*(a)*(vi), "Industrial Applicability."

Section 205

Numbering of Claims upon Amendment

(a) Any claim submitted after the filing date of the international application and which is not identical with the claims previously appearing in the international application shall, at the choice of the applicant, be submitted either:

(i) as an amended claim, in which case, it shall bear the same number as the previous claim it amends; that number shall be followed by the word "(amended)" or its equivalent in the language of the international application; or

(ii) as a new claim, in which case, it shall bear the next number after the highest previously numbered claim; that number shall be followed by the word "(new)" or its equivalent in the language of the international application.

(b) The deletion of any claim previously appearing in the international application shall be made by indicating the number of the previous claim followed by the word "(cancelled)" or its equivalent in the language of the international application.

Section 206

Common Representative Designated in the Request

If the applicants designate a common representative in accordance with Rule 4.8*(a)*, such common representative shall be indicated on the front page of the request Form. The indication of the common representative shall take the form of a statement designating the named applicant to act as the common representative on behalf of all the applicants.

Section 207

Arrangement of Elements and Numbering of Sheets of the International Application

(a) In effecting the sequential numbering of the sheets of the international application in accordance with Rule 11.7, the elements of the international application shall be placed in the following order: the request, the description, the claims, the abstract, the drawings.

(b) The sequential numbering of the sheets shall be effected by using three separate series of numbering, the first series applying to the request only and commencing with the first sheet of the request, the second series commencing with the first sheet of the description and continuing through the claims until the last sheet of the abstract, and the third series being applicable to the sheets of the drawings only and commencing with the first sheet of the drawings.

PART 3

INSTRUCTIONS RELATING TO THE RECEIVING OFFICE

Section 301

Notification of Receipt of Purported International Application

Any receiving Office may notify the applicant of the receipt of the purported international application. The notification should indicate the date of actual receipt, the international application number of the purported international application referred to in Section 307 and the applicant's file reference, where available, as well as, where useful for purposes of identification, the title of the invention.

Section 302

Notification of Priority Claim Considered Not To Have Been Made

Where, owing to failure to meet the requirements of Rule 4.10*(b)*, the priority claim is, for the purposes of procedure under the Treaty, considered not to have been made, the receiving Office shall indicate that fact in the international application by marking over the box in the request Form which provides for the information concerning the priority claim, the words "NOT TO BE CONSIDERED FOR PCT PROCEDURE" or its equivalent in the language of the international application. The receiving Office shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

Section 303

Deletion of Additional Matter in the Request

Where, under Rule 4.17*(b)*, the receiving Office deletes *ex-officio* any matter contained in the request, it shall do so by placing such matter between square brackets and entering the word "DELETED," or its equivalent in the language of the international application, in the right-

hand margin adjacent to the matter so placed between brackets, and shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

Section 304

Corrections Submitted to the Receiving Office Concerning Expressions, etc., not to be used in the International Application

Where the applicant submits corrections to the receiving Office aimed at complying with the prescriptions of Rule 9.1, that Office shall, if copies of the international application have not yet been transmitted to the International Bureau and the International Searching Authority, attach copies of such corrections to the international application. If copies of the international application have already been transmitted, the receiving Office shall transmit copies of such corrections to the said Bureau and the said Authority.

Section 305

Identifying the Copies of the International Application

(a) Where, under Rule 11.1*(a)*, the international application has been filed in one copy, the receiving Office shall, after preparing under Rule 21.1*(a)* the additional copies required under Article 12(1), mark,

(i) the words "RECORD COPY" in the upper left-hand corner of the first page of the original copy,

(ii) in the same space on one additional copy, the words "SEARCH COPY," and

(iii) in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

(b) Where, under Rule 11.1*(b)*, the international application has been filed in more than one copy, the receiving Office shall choose the copy most suitable for reproduction purposes, and mark the words "RECORD COPY," in the upper left-hand corner of its first page. After verifying the identity of any additional copies and, if applicable, preparing under Rule 21.1*(b)* the home copy, it shall mark, in the upper left-hand corner of the first page of one such copy, the words "SEARCH COPY," and, in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

Section 306

Change in the Person, Name or Address of the Applicant

Any request for the recording of any changes in the person or name of the applicant referred to in Rule 18.5 or Rule 54.4, or of any change in the address of the applicant shall be signed by the applicant or, if the receiving Office requested such change under Rule 18.5 or Rule 54.4, by the receiving Office. The request shall indicate the name or address of the applicant for which the change is requested.

Section 307

System of Numbering International Applications

Papers purporting to be an international application under Rule 20.1 shall be marked with the international application number, consisting of the letters "PCT," a slant, the two-letter code, as in *Annex B*, indicating the receiving Office, a two-digit indication of the last two numbers of the year in which such papers were first received, a slant and a five-digit number, allotted in sequential order corresponding to the order in which the international applications are received (e.g., "PCT/SU78/00001"). However, if a negative determination is made under Rule 20.7 or a declaration is made under Article 14(4), the letters "PCT" shall be deleted by the receiving Office from the indication of the international application number on any papers marked previously with that number, and the said number shall be used without such letters in any future correspondence relating to the purported international application.

Section 308

Marking of the Sheets of the International Application

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, the international application number referred to in Section 307 in the upper right-hand corner of each sheet of each copy of the purported international application.

(b) The data to be indicated on any replacement sheet under Rule 26.4*(b)* shall be indelibly marked by the receiving Office, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, in the upper right-hand corner of each replacement sheet.

Section 309

Procedure in the Case of Later Submitted Sheets

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, any sheet received on a date later than the date on which sheets were first received with the date on which it received that sheet, inserted immediately below the international application number referred to in Section 307.

(b) The receiving Office shall, in the case of later submitted sheets received within the time limits referred to in Rule 20.2*(a)*(i) and (ii):

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application;

(ii) notify the applicant of the correction effected under item (i) above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i) above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted sheets to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy and the search copy.

(c) the receiving Office shall, in the case of later submitted sheets received after the expiration of the time limits referred to in Rule 20.2*(a)*(i) and (ii):

(i) notify the applicant of that fact and of the date of receipt of the later submitted sheets;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted sheets to the International Bureau with the indication that such sheets are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy with the indication that such sheets are not to be taken into consideration for the purposes of international processing.

Section 310

Procedure in the Case of Missing Drawings

(a) Where the international application refers to drawings which in fact are not included in that application, the receiving Office shall make the indication referred to in Rule 26.6*(a)* by an appropriate marking of the request Form.

(b) Section 309*(a)* shall apply also in the case of drawings received by the receiving Office on a date later than the date on which sheets were first received by that Office.

(c) The receiving Office shall, in the case of missing drawings received within the time limit referred to in Rule 20.2*(a)*(iii):

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application, and delete the indication made under paragraph *(a)* above;

(ii) notify the applicant of the correction effected under item (i), above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i), above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted drawings to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy and the search copy.

(d) The receiving Office shall, in the case of missing drawings received after the expiration of the time limit referred to in Rule 20.2*(a)*(iii):

(i) notify the applicant of the fact and of the date of receipt of the later submitted drawings;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted drawings to the International Bureau with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing.

Section 311

Renumbering of Sheets of the International Application

(a) The receiving Office shall, subject to Section 207, sequentially renumber the sheets of the international application when necessitated by the addition of any new sheet, the deletion of entire sheets, a change in the order of the sheets or any other reason.

(b) The sheets of the international application shall be provisionally renumbered in the following manner:

(i) when a sheet is deleted, the receiving Office shall either include a blank sheet with the same number and with the word "deleted," or its equivalent in the language of the international application, below the number, or insert, in brackets, below the number of the following sheet, the number of the deleted sheet with the word "deleted" or its equivalent in the language of the international application;

(ii) when a sheet is substituted, the receiving Office shall write below the number of the new sheet the word "substitute" or its equivalent in the language of the international application;

(iii) when one or more sheets are added, each sheet shall be identified by the number of the preceding sheet followed by an oblique stroke and then by a natural number series, starting always with number one for the first sheet added after an unchanged sheet (e.g., 10/1, 15/1, 15/2, 15/3, etc.). When later additions of sheets to an existing series of added sheets are necessary, an extra digit shall be used for identifying the further additions (e.g., 15/1, 15/1/1, 15/1/2, 15/2, etc.).

(c) In the cases mentioned in (i) and (iii) above, it is recommended that the receiving Office should write, below the number of the last sheet, the total number of the sheets of the international application followed by the words "TOTAL OF SHEETS" or their equivalent in the language of the international application. It is further recommended that, at the bottom of any last sheet added, the words "LAST ADDED SHEET" or their equivalent in the language of the international application should be inserted.

Section 312

Notification of Decision not to Issue Declaration that the International Application is Considered Withdrawn

Where the receiving Office, after having notified the applicant under Rule 29.4 of its intent to issue a declaration under Article 14(4), decides not to issue such a declaration, it shall notify the applicant accordingly.

Section 313

Manner of Making the Necessary Annotations in the Check List

Where, under Rule 3.3*(b)*, the receiving Office itself fills in the check list, that Office shall mark, next to such check list, the words "FILLED IN BY RO," or their equivalent in the language of the international application. Where only some of the indications are filled in by the receiving Office, the said words and each indication filled in by that Office shall be identified by an asterisk.

Section 314

Manner of Indicating Correction of the Priority Date or Cancellation of the Priority Claim

(a) Where, under Rule 4.10*(d)*, the applicant corrects the erroneously indicated filing date of any earlier application, the receiving Office shall enter the corrected date in the request and draw a line through the previously entered date while still leaving it legible.

(b) Where, under Rule 4.10*(d)*, the receiving Office cancels the declaration made under Article 8(1), that Office shall mark over the said declaration the words "CANCELLED ON REQUEST OF APPLICANT" or "CANCELLED EX OFFICIO BY RO," or their equivalent in the language of the international application, as the case may be.

Section 315

Notification of Non-Collection of Record Copy

Where, under Rule 22.2*(d)*, the receiving Office has, in accordance with the applicant's wish, held the record copy at the disposal of the applicant, and the applicant has not collected that copy by the expiration of the time limit for receipt of that copy by the International Bureau, the receiving Office shall notify the applicant accordingly.

Section 316

Procedure in the Case where the International Application Lacks the Prescribed Signature

Where, under Article 14(1)*(a)*(i), the receiving Office finds that any international application is defective in that it lacks the prescribed signature, that Office shall send to the applicant, together with the invitation to correct under Article 14(1)*(b)*, a copy of the request part of the international application. The applicant shall, within the prescribed time limit, return said copy after affixing thereto the prescribed signature.

PART 4

INSTRUCTIONS RELATING TO THE INTERNATIONAL BUREAU

Section 401

Marking of Sheets of the Record Copy

The International Bureau shall, under Rule 24.1, mark the date of receipt of the record copy in the appropriate space on the request Form and place the stamp of the International Bureau in the lower right-hand corner of each sheet of the record copy.

Section 402

Notification of Correction of the Priority Date or Cancellation of the Priority Claim

Where, under Rule 4.10*(d)*, the correction of the priority date or the cancellation of the priority claim is effected by the International Bureau, the manner of indicating the correction or cancellation set forth in Section 314 shall apply *mutatis mutandis*. The receiving Office, in addition to the applicant and the International Searching Authority, shall be notified accordingly by the International Bureau.

Section 403

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

Where, under Rules 40.2*(c)* or 68.3*(c)*, the International Bureau receives a request from the applicant to forward to any designated or elected Office the texts of both the protest against payment of an additional fee and the decision thereon by the International Searching Authority or the International Preliminary Examining Authority, as the case may be, it shall proceed according to such request.

Section 404

International Publication Number

The International Bureau shall assign to each published international application an international publication number which shall be different from the international application number. The international publication number shall be used on the pamphlet and in the Gazette entry. It shall consist of the two-letter code "WO" followed by a two-digit designation of the last two numbers of the year of publication, a slant, and a serial number consisting of five digits (e.g., "WO78/12345").

Section 405

Special Publication Fee

The special publication fee provided for in Rule 48.4 shall be 200 Swiss francs.

Section 406

Pamphlets

(a) Pamphlets referred to in Rule 48.1 shall be published on a given day of each week.

(b) All pamphlets shall be of A4 size and shall be printed by offset, recto-verso.

(c) The form and particulars of the front page of each pamphlet shall be decided by the Director General.

Section 407

The Gazette

(a) The Gazette referred to in Rule 86 shall be of A4 size and shall be printed by offset, recto-verso.

(b) In addition to the contents specified in Rule 86, the Gazette shall contain, in respect of each published international application, the data indicated in *Annex D*.

(c) The information referred to in Rule 86.1(v) shall be that which is indicated in *Annex E*.

(d) The subscription price of the Gazette shall be as fixed by the Director General*. The price of any single issue of the Gazette shall be as fixed by the Director General*.

Section 408

Priority Application Number

(a) If the application number of the earlier application referred to in Rule 4.10*(c)* (priority application number) is furnished to the International Bureau within the prescribed time limit, that Bureau shall enter the said number in the space provided therefor in the request Form.

(b) If the priority application number is furnished after the expiration of the prescribed time limit, the International Bureau shall indicate, in the international publication, the date on which the said number was furnished, by including on the front page of the pamphlet next to the priority application number the words "FURNISHED LATE ON ... (date)," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

(c) If the priority application number has not been furnished at the time of the international publication, the International Bureau shall indicate that fact by including on the front page of the pamphlet in the space provided for the priority application number the words "NOT FURNISHED AT TIME OF THIS PUBLICATION," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

Section 409

Notification of Priority Claim Considered not to have been Made

Where the International Bureau notes that the receiving Office has failed to notify the applicant as provided in Section 302, it shall send a notification to the same effect to the applicant, the receiving Office and the International Searching Authority.

Section 410

Numbering of Sheets of the International Application for Purposes of International Publication

In the course of preparing the international application for international publication, the International Bureau shall sequentially renumber the sheets of the international application only when necessitated by the addition of any new sheet, the deletion of entire sheets or a change in the order of the sheets. Otherwise, the numbering provided under Section 207 shall be maintained.

Section 411

Notification that the Certified Copy of the Priority Document has not been Submitted

Where the time limit under Rule 17.1*(a)* has expired and the International Bureau has not received a certified copy of the priority document, it shall notify the applicant and the designated Offices accordingly.

---

* This provision is applicable during the transitional period referred to in Rule 86.4*(b)*.

PART 5

INSTRUCTIONS RELATING TO THE INTERNATIONAL SEARCHING AUTHORITY

Section 501

Corrections Submitted to the International Searching Authority Concerning Expressions, etc., not to be used in the International Application

Where the applicant submits corrections to the International Searching Authority aimed at complying with the prescription of Rule 9.1, that Authority shall transmit copies of such corrections to the receiving Office and the International Bureau.

Section 502

Protest Against Payment of Additional Fee and Decision Thereon

The International Searching Authority shall transmit to the applicant, at the latest, together with the international search report, any decision which it has taken under Rule 40.2*(c)* on the protest of the applicant against the payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the designated Offices.

Section 503

Method of Identifying Documents Cited in the International Search Report

Identification of any document cited in the international search report referred to in Rule 43.5*(b)* shall be made by indicating the following elements in the order in which they are listed:

(a) In the case of any patent document (patent documents being patents within the meaning of Article 2(ii) as well as published applications relating thereto):

(i) the Office that issued the document, by the two-letter code as in *Annex B*;

(ii) the kind of document, by the appropriate symbols as in *Annex C*;

(iii) the number of the document as given to it by the Office that issued it (for Japanese patent documents the indication of the year of the reign of the Emperor must precede the serial number of the patent document);

(iv) the date of publication of the cited patent document as indicated thereon;

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings; and

(vi) the name of the patentee or applicant.

(The following example illustrates the citation of a patent document according to paragraph *(a)* above:

JA, B, 5014535, published 1975, May 28, see column 4, lines 3 to 27, NCR Corporation.)

(b) In the case of any book or other separately issued publication:

(i) the name of the author;

(ii) the title (including, where applicable, the number of the edition and/or volume);

(iii) the year of publication (when this coincides with the year of the international application or of the priority claim, the International Searching Authority shall endeavor to determine the month and, if necessary, the day of publication and to indicate these data in the international search report);

(iv) the name of the publisher;

(v) as far as available, the place of publication (where only the location of the publisher appears on the book or other separately issued publication, then that location shall be indicated as the place of publication); and

(vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a book or other separately issued publication according to paragraph *(b)* above:

H. Walton, "Microwave Quantum Theory," Volume 2, published 1973, by Sweet and Maxwell (London), see pages 138 to 192, especially pages 146 to 148.)

(c) In the case of any article published in a periodical or other serial publication:

(i) the title of the periodical or other serial publication;

(ii) the number of the volume and the date of the issue in which the article appears;

(iii) as far as available, the place of publication (where only the location of the publisher appears in the periodical or other serial publication, then that location shall be indicated as the place of publication);

(iv) the author and the title of the article and the number of the page both on which the article starts and ends; and

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of an article published in a periodical or other serial publication according to paragraph *(c)* above:

IBM Technical Disclosure Bulletin, Volume 17 No. 5, issued 1974 October (Armonk, New York), J. G. Drop, "Integrated Circuit Personalization at the Module Level" see pages 1344 to 1345.)

(d) In the case of abstracts:

(i) the identification of the document containing the abstract in the manner set forth in paragraphs *(a)*, *(b)* and *(c)*, respectively, depending upon whether the abstract is contained in a patent document, in a book or other separately issued publication, or in an article published in a periodical or other serial publication;

(ii) in the case where the abstract is not published together with the full text document which served as its basis, the identification of both abstract and full text document on the basis of whatever bibliographic data may be available in respect thereto.

(The following example illustrates the citation of an abstract according to paragraph *(d)* (ii) above:

Chemical Abstracts, Volume 75, No. 20, issued 1971, November 15 (Columbus, Ohio, U.S.A.), D. I. Shetulov, "Surface Effects During Metal Fatigue," see page 163, column 1, the abstract No. 120718k, Fiz.-Khim. Mekh. Mater. 1971, 7(2), 7-11 (Russ).)

Section 504

Classification of the Subject Matter of the International Application

(a) Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed

in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols.

(b) Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system.

(c) Where the subject matter of the international application is classified both according to the International Patent Classification and to any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other.

Section 505

Indication of Citations of Particular Relevance in the International Search Report

Where any document cited in the international search report is of particular relevance, the special indication required by Rule 43.5*(c)* shall consist of the letter "X" placed next to the citation of the said document.

Section 506

Comments on Draft Translation of the International Application

(a) Where the applicant has made comments, within the time limits fixed by the International Searching Authority, on the draft translation referred to in Rule 48.3*(b)*, that Authority shall notify the applicant whether it has changed the draft translation and, if so, of the changes it has made therein.

(b) Where the applicant submits comments on the draft translation after the expiration of the time limit fixed by the International Searching Authority, and that Authority changes the draft translation, it shall notify the applicant accordingly.

Section 507

Manner of Indicating Certain Special Categories of Documents Cited in the International Search Report

(a) Where any document cited in the international search report refers to an oral disclosure, use, exhibition, or other means referred to in Rule 33.1*(b)*, the separate indication required by that Rule shall consist of the letter "O" placed next to the citation of the said document.

(b) Where any document cited in the international search report is a published application or patent as defined in Rule 33.1*(c)*, the special mention required by that Rule shall consist of the letter "E" placed next to the citation of the said document.

(c) Where any document cited in the international search report is a document which defines the general state of the art, it shall be indicated by the letter "A" placed next to the citation of the said document.

(d) Where any document cited in the international search report is a document whose publication date occurred earlier than the international filing date of the international application, but later than the priority date claimed in that application, it shall be indicated by the letter "P" next to the citation of the said document.

(e) Where any document cited in the international search report is a document whose publication date occurred after the filing date or the priority date of the international application and is not in conflict with the said application, but is cited for the principle or theory underlying the

invention, which may be useful for a better understanding of the invention, or is cited to show that the reasoning or the facts underlying the invention are incorrect, it shall be indicated by the letter "T" next to the citation of the document.

(f) Where in the international search report any document is cited for reasons other than those referred to in the preceding paragraphs, such document shall be indicated by the letter "L" next to the citation of the document.

Section 508

Manner of Indicating the Claims to which the Documents Cited in the International Search Report are Relevant

The claims to which cited documents are relevant shall be indicated by placing in the appropriate column of the international search report:

(i) where the cited document is relevant to one claim, the number of that claim; for example (2) or (17);

(ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen; for example, (1-15) or (2-3);

(iii) where the cited document is relevant to two or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example (1, 6) or (1, 7, 10);

(iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1-6, 9-10, 12-15) or (1, 3-4, 6, 9-11).

PART 6

INSTRUCTIONS RELATING TO THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Section 601

Determination Whether Applicant is Entitled to make a Demand

(a) Where the International Preliminary Examining Authority finds that the applicant is not entitled under Article 31(2) or, where there are several applicants, that none of the applicants is entitled under Rule 54.2 to make a demand, the International Preliminary Examining Authority shall notify both the applicant or applicants and the International Bureau accordingly.

(b) Where the International Preliminary Examining Authority finds that, in the case of different applicants for different elected States, none of the applicants indicated for the purposes of a given elected State is entitled under Rule 54.3 to make a demand and that therefore the election of that State shall be considered not to have been made, the International Preliminary Examining Authority shall notify accordingly both the applicant or applicants so indicated and the International Bureau.

Section 602

Marking of Replacement Sheets and Renumbering of Sheets of the International Application

(a) The data to be indicated on any replacement sheet according to Rule 66.8*(b)* shall be indelibly marked by the International Preliminary Examining Authority, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, in the upper right-hand corner of each replacement sheet.

(b) Section 311 applies, *mutatis mutandis*, to the renumbering of sheets of the international application.

Section 603

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

The International Preliminary Examining Authority shall transmit to the applicant, at the latest together with the international preliminary examination report, any decision which it has taken under Rule 68.3*(c)* on the protest of the applicant against payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the elected Offices.

Section 604

Guidelines for Explanations Contained in the International Preliminary Examination Report

Explanations under 70.8 shall clearly point out to which of the three criteria referred to in Article 35(2), taken separately, any cited document is applicable and shall clearly describe, with reference to the cited documents, the reasons supporting the conclusion that any of the said criteria is or is not satisfied.

[Annexes follow]

ANNEX A

Names of States

(Members of the Paris Union as at May 31, 1977)

Short Title	*Full Name*
Algeria	People's Democratic Republic of Algeria
Argentina	Argentine Republic
Australia	Commonwealth of Australia
Austria	Republic of Austria
Bahamas	Commonwealth of the Bahamas
Belgium	Kingdom of Belgium
Benin	People's Republic of Benin
Brazil	Federative Republic of Brazil
Bulgaria	People's Republic of Bulgaria
Cameroon	United Republic of Cameroon
Canada	Canada
Central African Empire	Central African Empire
Chad	Republic of Chad
Congo	People's Republic of the Congo
Cuba	Republic of Cuba
Cyprus	Republic of Cyprus
Czechoslovakia	Czechoslovak Socialist Republic
Denmark	Kingdom of Denmark
Dominican Republic	Dominican Republic
Egypt	Arab Republic of Egypt
Finland	Republic of Finland
France	French Republic
Gabon	Gabonese Republic
German Democratic Republic	German Democratic Republic
Germany, Federal Republic of	Federal Republic of Germany
Ghana	The Republic of Ghana
Greece	Hellenic Republic
Haiti	Republic of Haiti
Holy See	Holy See
Hungary	Hungarian People's Republic
Iceland	Republic of Iceland
Indonesia	Republic of Indonesia
Iran	Empire of Iran
Iraq	Republic of Iraq
Ireland	Ireland
Israel	State of Israel
Italy	Italian Republic
Ivory Coast	Republic of the Ivory Coast
Japan	Japan
Jordan	Hashemite Kingdom of Jordan
Kenya	Republic of Kenya
Lebanon	Lebanese Republic
Libyan Arab Jamahiriya	The Socialist People's Libyan Arab Jamahiriya

Annex A, page 2

Short Title	*Full Name*
Liechtenstein	Principality of Liechtenstein
Luxembourg	Grand Duchy of Luxembourg
Madagascar	Democratic Republic of Madagascar
Malaŵi	Republic of Malaŵi
Malta	Republic of Malta
Mauritania	Islamic Republic of Mauritania
Mauritius	Mauritius
Mexico	United Mexican States
Monaco	Principality of Monaco
Morocco	Kingdom of Morocco
Netherlands	Kingdom of the Netherlands
New Zealand	New Zealand
Niger	Republic of the Niger
Nigeria	Federal Republic of Nigeria
Norway	Kingdom of Norway
Philippines	Republic of the Philippines
Poland	Polish People's Republic
Portugal	Portuguese Republic
Romania	Socialist Republic of Romania
San Marino	Republic of San Marino
Senegal	Republic of Senegal
Socialist Republic of Viet Nam	Socialist Republic of Viet Nam
South Africa	Republic of South Africa
Southern Rhodesia	Southern Rhodesia
Soviet Union	Union of Soviet Socialist Republics
Spain	Spanish State
Sri Lanka	Republic of Sri Lanka
Surinam	Republic of Surinam
Sweden	Kingdom of Sweden
Switzerland	Swiss Confederation
Syria	Syrian Arab Republic
Tanzania	United Republic of Tanzania
Togo	Togolese Republic
Trinidad and Tobago	Republic of Trinidad and Tobago
Tunisia	Republic of Tunisia
Turkey	Republic of Turkey
Uganda	Republic of Uganda
United Kingdom	United Kingdom of Great Britain and Northern Ireland
United States of America	United States of America
Upper Volta	Republic of the Upper Volta
Uruguay	Eastern Republic of Uruguay
Yugoslavia	Socialist Federal Republic of Yugoslavia
Zaire	Republic of Zaire
Zambia	Republic of Zambia

[Annex B follows]

ANNEX B

Code for Identifying States and Organizations*

AR	Argentina
AT	Austria
AU	Australia
BE	Belgium
BG	Bulgaria
BJ	Benin (Dahomey)
BR	Brazil
BS	Bahamas
CA	Canada
CF	Central African Empire
CG	Congo
CH	Switzerland
CI	Ivory Coast
CM	Cameroon
CS	Czechoslovakia
CU	Cuba
CY	Cyprus
DD	German Democratic Republic
DE	Germany, Federal Republic of
DK	Denmark
DO	Dominican Republic
DZ	Algeria
EG	Egypt
ES	Spain
FI	Finland
FR	France
GA	Gabon
GB	United Kingdom
GH	Ghana
GR	Greece
HT	Haiti
HU	Hungary
HV	Upper Volta
ID	Indonesia
IE	Ireland
IL	Israel
IQ	Iraq
IR	Iran
IS	Iceland
IT	Italy
JO	Jordan
JP	Japan
KE	Kenya
LB	Lebanon
LI	Liechtenstein

* The States listed are those which are members of the Paris Union. This code is based upon ICIREPAT recommendations and is valid as of January 1, 1978.

LK	Sri Lanka
LU	Luxembourg
LY	Socialist People's Libyan Arab Jamahiriya
MA	Morocco
MC	Monaco
MG	Madagascar
MR	Mauritania
MT	Malta
MU	Mauritius
MW	Malawi
MX	Mexico
NE	Niger
NG	Nigeria
NL	Netherlands
NO	Norway
NZ	New Zealand
PH	Philippines
PL	Poland
PT	Portugal
RH	Southern Rhodesia
RO	Romania
SE	Sweden
SM	San Marino
SN	Senegal
SR	Surinam
SU	Soviet Union
SY	Syrian Arab Republic
TD	Chad
TG	Togo
TN	Tunisia
TR	Turkey
TT	Trinidad and Tobago
TZ	United Republic of Tanzania
UG	Uganda
US	United States of America
UY	Uruguay
VA	Vatican City State (Holy See)
VN	Viet Nam, Socialist Republic of
YU	Yugoslavia
ZA	South Africa
ZM	Zambia
ZR	Zaire

OA	African Intellectual Property Organization
EP	European Patent Office
WO	International Bureau of WIPO

[Annex C follows]

ANNEX C

Standard Code for Identification of Different Kinds of Patent Documents

Introduction

1. The recommendation provides for groups of letter codes in order to distinguish patent documents. The letter codes also facilitate the storage and retrieval of such documents.

2. If any Office wants to amplify the information contained in the letter code, this letter code may be optionally associated with a numerical code. The meaning of such numerical code should then be defined by each Patent Office availing itself of this option.

3. The code also provides for a letter for non-patent literature documents (N) and for documents to be restricted to the internal use of Patent Offices (X) (e.g., confidential documents, not to be disclosed outside the Office). See in this respect also SI.1 (ICIREPAT Manual pages 4.3.1.1 to 4.3.1.4).

Definitions

4. For the purposes of this recommendation, the expression "patent documents" includes patents for inventions, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, utility certificates of addition, plant patents and published applications therefor.

5. For the purposes of this recommendation, the term "entry in an official gazette" means at least one comprehensive announcement in an official gazette regarding the making available to the public of the complete text, claims (if any) and drawings (if any) of a patent document.

6. For the purposes of this recommendation, the terms "publication" and "published" are used in the sense of making available

(i) a patent document to the public for inspection or supplying a copy on request

(ii) multiple copies of a patent document produced by printing or like process

Explanation: If, at a particular procedural stage, a copy of the document is first made available to the public for inspection or copying and is then, *a: the same procedural stage*, made available in multiple copies produced by printing or like process, only a single publication is considered to have occured. If, on the other hand, multiple reproduction results from a new procedural stage, this reproduction is considered to be a further publication of the document, even if the texts at the two stages are identical.

7. According to certain national patent laws or regulations, the same patent application may be published at various procedural stages. For the purposes of this recommendation, a publication level is defined as the level corresponding to a procedural stage at which normally a document is published under a given national patent law.

Recommendation

8. It is recommended that the code:

(a) be used for the recording of the "kind of document" in machine-readable data carriers, such as 80-column punched cards, magnetic tapes, aperture cards, etc.;

(b) be used on the first page of patent documents, preferably near the document number, if these have been published in the sense of paragraph 6;

(c) be used in entries in official gazettes or, if all entries in a section of the Gazette relate to the same kind of a document at the beginning of such a section.

(d) be used for the identification of patent documents cited in "Search Reports" and "Lists of References" in patent documents (INID Number 56).

9. *Code*

The Code is subdivided into *mutually exclusive* groups of letters. The groups characterize patent documents and documents specified in paragraph 3. Groups 1-5 comprise one or several letters enabling identification of documents pertaining to different publication levels.

Group 1 Use for primary or major series of patent documents

A First publication level
B Second publication level
C Third publication level

Group 2 Use for secondary series of patent documents

E First publication level
F Second publication level
G Third publication level

Group 3 Use for further series of patent documents, as the special requirements of each Office may be

H
I

Group 4 Use for major special types of patent documents

M Medicament patent documents
P Plant patent documents

Group 5 Use for utility model documents having a numbering series other than the documents of Group 1

U First publication level
Y Second publication level
Z Third publication level

Group 6 Other (see paragraph 3)

N Non-patent literature documents
X Documents restricted to the internal use of Offices

10. It is understood that documents resulting from a patent application and being identified as the major series will fall under Group 1 (e.g. DT Offenlegungsschrift, Auslegeschrift and Patentschrift). However, documents identified as a secondary series will fall under Group 2 (e.g., FR patent of addition under old law, US reissue). In exceptional cases of need for a further series, Group 3 is reserved for such purposes (e.g., US defensive publication). Group 4 applies only, at present, to special documents concerning the medicament patents published in France and the plant patents published in the United States of America. In any country publishing similar documents, Group 4 should then be used.

11. As indicated in paragraph 2, the above letter code may optionally be associated with a numerical code to amplify the information represented by the letter code. For this numerical code only digits 1 to 9 should be used. The significance of this code will be defined by any national Office applying such code and communicated to the International Bureau, which will publicize this

information. The numerical code must always be interpreted in conjunction with the country code and the above letter code.

12. As an appendix to this recommendation a list of patent documents, past and currently published, and intended to be published in the future, divided in accordance with the code, is given.

[Appendices I & II follow]

Original: STAC III No. 43d, expanded to STAC III No. 93a
Adopted by the first session of the PLC.
First amended version adopted by the fifth PLC ordinary session (document IC/PLC/V/11, paragraphs 65 to 68).
Second amended version adopted by the seventh PLC ordinary session (document IC/PLC/VII/16, paragraph 30).
Third amended version adopted by the tenth PLC ordinary session (document IC/PLC/X/11, paragraph 24).

Appendix I

List of Patent Documents, Past and Currently Published, and Intended to be Published in the Future, Divided in Accordance with this Code

Code: A Patent Documents Numbered in Primary or Major Series – First Publication Level

Examples:	Austria	Patent Application published in the sense of paragraph 6(i)
	Belgium	Brevet d'invention/Uitvindingsoctrooi
	Belgium	Brevet de perfectionnement/Verbeteringsoctrooi
	Bulgaria	Opisanie na izobretenie po patent
	Canada	Patent
	Cuba	Patent Application published in the sense of paragraph 6(i)
	Czechoslovakia	Patent Application published in the sense of paragraph 6(i)
	Czechoslovakia	Inventor's Certificate Application published in the sense of paragraph 6(i)
	Denmark	Patent Application published in the sense of paragraph 6(i)
	Egypt	Patent specification
	Europat	Document published after 18 months
	Finland	Patent Application published in the sense of paragraph 6(i)
	France	Brevet d'invention (old law)
	France	Brevet d'invention, première et unique publication
	France	Certificat d'addition à un brevet d'invention, première et unique publication
	France	Certificat d'utilité, première et unique publication
	France	Certificat d'addition à un certificat d'utilité, première et unique publication
	France	Demande de brevet d'invention, première publication
	France	Demande de certificat d'addition à un brevet d'invention, première publication
	France	Demande de certificat d'utilité, première publication
	France	Demande de certificat d'addition à un certificat d'utilité, première publication
	German Democratic Republic	Patentschrift (Ausschliessungspatent), granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic
	German Democratic Republic	Patentschrift (Wirtschaftspatent), granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic
	Germany, Federal Republic of	Offenlegungsschrift
	Hungary	Patent Application published in the sense of paragraph 6(i)
	India	Patent specification
	Ireland	Patent specification
	Italy	Brevetto per invenzione industriale
	Japan	Kokai tokkyo koho
	Luxembourg	Brevet d'invention
	Luxembourg	Certificat d'addition à un brevet d'invention
	Netherlands	Ter inzage gelegde octrooiaanvrage
	Norway	Patent Application published in the sense of paragraph 6(i)
	Pakistan	Patent specification

Code: A (continued)

Examples:	PCT	Pamphlet published after 18 months
	Poland	Opis patentovy
	Romania	Descrierea invenţiei
	Soviet Union	Opisanie izobreteniya k patentu
	Soviet Union	Opisanie izobreteniya k avtorskomy svidetelstvu
	Spain	Patente de invención
	Sweden	Patent Application published in the sense of paragraph 6(i)
	Switzerland	Auslegeschrift/Mémoire Exposé/Esposto Memoriale (Patent Application published in the sense of paragraphs 6(i) and 6(ii) pertaining to the technical fields for which search and examination as to novelty are made)
	Switzerland	Patentschrift/Exposé d'invention/Esposto d'invenzione (Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which neither search nor examination as to novelty are made)
	United Kingdom	Patent specification
	United States	Patent
	Yugoslavia	Patentni spis

Code: B Patent Documents Numbered in Primary or Major Series – Second Publication Level

Examples:	Australia	Patent specification
	Austria	Patentschrift
	Canada	Reissue
	Cuba	Patente de invención
	Czechoslovakia	Popis vynálezu k patentu
	Czechoslovakia	Popis vynálezu k autorskému osvědčení
	Denmark	Fremlaeggelsesskrift
	Finland	Kuulutusjulkaisu – Utläggningsskrift
	France	Brevet d'invention, deuxième publication de l'invention
	France	Certificat d'addition à un brevet d'invention, deuxième publication de l'invention
	France	Certificat d'utilité, deuxième publication de l'invention
	France	Certificat d'addition à un certificat d'utilité, deuxième publication de l'invention
	German Democratic Republic	Patentschrift (Ausschließungspatent), granted in accordance with paragraph 29 of the Patent Act of the German democratic Republic
	German Democratic Republic	Patentschrift (Wirtschaftspatent), granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic
	Germany, Federal Republic of	Auslegeschrift
	Hungary	Szabadalmi leiras
	Japan	Tokkyo koho
	Netherlands	Openbaar gemaakte octrooiaanvrage
	Norway	Utlegningsskrift
	Sweden	Utläggningsskrift

Code: B (continued)

Examples:	Switzerland	Patentschrift/Exposé d'invention/Esposto d'invenzione (Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which search and examination as to the novelty are made)
	United Kingdom	Amended Patent Specification

Code: C Patent Documents Numbered in Primary or Major Series – Third Publication Level

Examples:	Denmark	Patent
	Finland	Patentti – Patent
	Germany, Federal Republic of	Patentschrift
	Netherlands	Octrooi
	Norway	Patent
	Sweden	Patentskrift

Code : E Patent Documents Numbered in Secondary Series – First Publication Level

Examples:	France	Certificat d'addition à brevet d'invention (old law)
	United States	Reissue

Code: H Patent Documents numbered in further series

Example:	United States	Defensive publication

Code: M Medicament Patent Documents

Examples:	France	Brevet spécial de médicament
	France	Addition à un brevet spécial de médicament

Code: P Plant Patent Documents

Examples:	United States	Plant patent

Code: U Utility Model Documents Numbered in Series other than the Documents of Group I – First Publication Level

Examples:	Germany, Federal Republic of	Gebrauchsmuster
	Japan	Kokai jitsuyo shinan koho
	Spain	Utility Model Application published in the sense of paragraph 6(i)

Code: Y Utility Model Documents Numbered in Series other than the Documents of Group I – Second Publication Level

Examples:	Japan	Jitsuyo shinan koho
	Spain	Modelo de utilidad

[Appendix II follows]

Appendix II

List of Patent Documents, Past and Currently Published, broken down by issuing country and coded in accordance with the SI.8 Code

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Australia	Unexamined complete specification open to public inspection (not marked on document)		Unexamined Patent Application published in the sense of paragraph 6(i)	A	
	Patent specification		Patent published in the sense of paragraph 6(ii)	B	
Austria	Aufgebot (not marked on document but indicated as such in the Official Gazette)	Document laid open	Patent Application published in the sense of paragraph 6(i)	A	
	Patentschrift	Patent specification	Patent published in the sense of paragraph 6(ii)	B	
Belgium	Brevet d'invention/ Uitvindingsoctrooi	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
	Brevet de perfectionnement/ Verbeteringsoctrooi	Patent of improvement	Patent of improvement published in the sense of paragraph 6(ii)	A	
	Brevet d'importation/ Invoeringsoctrooi	Patent of importation	Patent of importation published in the sense of paragraph 6(ii)	A	
Bulgaria	ОПИСАНИЕ НА ИЗОБРЕТЕНИЕ ПО ПАТЕНТ (Opisanie na izobretenie po patent)	Description of invention for a patent	Patent published in the sense of paragraph 6(ii)	A	
	ОПИСАНИЕ НА ИЗОБРЕТЕНИЕ ПО АВТОРСКО СВИДЕТЕЛСТВО (Opisanie na izobretenie po avtorsko svidetelstvo)	Description of invention for an author's certificate	Inventor's certificate published in the sense of paragraph 6(ii)	A	
Canada	Patent/Brevet		Patent published in the sense of paragraph 6(ii)	A	
	Reissue Patent/Brevet de redélivrance		Patent reissued and republished in the sense of paragraph 6(ii)	B	
Cuba	Publicación de la solicitud (not marked on document)	Publication of the application	Patent application published in the sense of paragraph 6(i)	A	
	Patente de invención	Patent of invention	Patent published in the sense of paragraph 6(ii)	B	

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Czechoslovakia	Přihláska vynálezu (se žádostí o autorské osvědčedí)	Application for an invention asking for author's certificate	Application for inventor's certificate published in the sense of paragraph 6(i), in accordance with Law No. 84 of 01.11.1972	A	1
	Přihláska vynálezu (se žádostí o patent)	Application for an invention asking for a patent	Patent application published in the sense of paragraph 6(i), in accordance with Law No. No. 84 of 01.11.1972	A	2
	Patentová přihláska or Přihláska vynálezu	Patent application or Application for invention	Patent application published in the sense or paragraph 6(i) up to patent No. 149260 (granted before the entry into force of Law No. 84 of 01.11.1972)	A	5
	Popis vynálezu k autorskému osvědčeni	Description of an invention for an author's certificate	Inventor's certificate published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	1
	Popis vynálezu k patentu	Description of an invention for a patent	Patent published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	2
	Popis vynálezu k autorskému osvědčeni	Description of an invention for an author's certificate	Dependant author's certificate published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	3
	Popis vynálezu k patentu	Description of an invention for a patent	Dependent patent published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	4
	Patentovy spis	Patent specification	Patent published in the sense of paragraph 6(ii), up to No. 149 260, granted before the entry into force of Law No. 84 of 01.11.1972	B	5
Denmark	Almindeling tilgaengelig patentansøgning	Patent application accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Fremlaeggelsesskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraph 6(ii)	B	

Annex C, page 9

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Denmark (cont'd)	Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
Egypt	إدارة براءات الاختراع (Idarat bara'at alikhtirah)	Authority for Patent Delivery	Patent published in the sense of paragraph 6(ii)	A	
Finland	Julkiseksi tullut patenttihakemus (not marked on the document)	Patent application made accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Kuulutusjulkaisu – Utläggningsskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	
	Patentti-Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
France	Demande de brevet d'invention	Application for patent of invention	Patent application, first publication, published in the sense of paragraph 6(ii)	A	1
	Demande de certificat d'addition à un brevet d'invention	Application for a certificate of addition to a patent of invention	Application for a certificate of addition, first publication, published in the sense of paragraph 6(ii)	A	2
	Demande de certificat d'utilité	Application for certificate of utility	Utility certificate application, first publication, published in the sense of paragraph 6(ii)	A	3
	Demande de certificat d'addition à un certificat d'utilité	Application for a certificate of addition to a certificate of utility	Application for a certificate of addition to a utility certificate, first publication, published in the sense of paragraph 6(ii)	A	4
	Brevet d'invention	Patent of invention	Patent, first and only publication, published in the sense of paragraph 6(ii)	A	5
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent, first and only publication, published in the sense of paragraph 6(ii)	A	6
	Certificat d'utilité	Certificate of utility	Utility certificate, first and only publication, published in the sense of paragraph 6(ii)	A	7

Annex C, page 10

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
France (cont'd)	Certificat d'addition à un certificat d'utilité	Certificate of addition to a certificate of utility	Certificate of addition to a utility certificate, first and only publication, published in the sense of paragraph 6(ii)	A	8
	Brevet d'invention	Patent of invention	Patent, second publication, published in the sense of paragraph 6(ii)	B	1
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent, second publication, published in the sense of paragraph 6(ii)	B	2
	Certificat d'utilité	Certificate of utility	Utility certificate, second publication, published in the sense of paragraph 6(ii)	B	3
	Certificat d'addition à un certificat d'utilité	Certificate of addition to a certificate of utility	Certificate of addition to a utility certificate, second publication, published in the sense of paragraph 6(ii)	B	4
	Brevet d'invention	Patent of invention	Patent (old law) published in the sense of paragraph 6(ii)	A	
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent (old law) published in the sense of paragraph 6(ii)	E	
	Brevet spécial de médicament	Special patent for medicament	Medicament patent (old law) published in the sense of paragraph 6(ii)	M	
	Certificat d'addition à un brevet spécial de médicament	Certificate of addition to a special patent for medicament	Certificate of addition to a medicament patent (old law) published in the sense of paragraph 6(ii)	M	
German Democratic Republic	Patentschrift (Ausschliessungs-patent)	Patent specification (Exclusive Patent)	Exclusive patent, granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic, published in the sense of paragraph 6(ii)	A	
	Patentschrift (Wirtschaftpatent)	Patent specification (Economic Patent)	Industrial patent, granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic, published in the sense of paragraph 6(ii)	A	

Annex C, page 11

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
German Democratic Republic (cont'd)	Patentschrift (Ausschliessungspatent)	Patent specification (Exclusive Patent)	Exclusive patent granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic, (2nd publication after examination as to novelty whenever this examination is effected), published in the sense of paragraph 6(ii)	B	
	Patentschrift (Wirtschaftspatent)	Patent specification (Economic Patent)	Industrial patent granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic (2nd publication after examination as to novelty whenever this examination is effected), published in the sense of paragraph 6(ii)	B	
	Berichtigte Patentschrift (Ausschliessungspatent)	Corrected patent specification (Exclusive Patent)	Corrected patent (Exclusive patent) published in the sense of paragraph 6(ii)	C	
	Berichtigte Patentschrift (Wirtschaftspatent)	Corrected patent specification (Economic Patent)	Corrected patent (Industrial patent) published in the sense of paragraph 6(ii)	C	
Germany (Federal Republic of)	Offenlegungsschrift	Document open for inspection	Patent application published, before examination as to novelty, in the sense of paragraph 6(ii)	A	
			– 1st publication	A	1
			– 2nd publication. Modified reprint following A1 Offenlegungsschrift or B1 Auslegeschrift	A	2
			– 3rd publication. Modified reprint following A2 Offenlegungsschrift or B2 Auslegeschrift	A	3
	Auslegeschrift	Document laid open	Patent application published, after examination as to novelty, in the sense of paragraph 6(ii)	B	
			– 1st publication. Offenlegungsschrift not yet published	B	1
			– 2nd publication. Normally following an A1 Offenlegungsschrift or B1 Auslegeschrift	B	2

Annexe C, page 12

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Germany (Federal Republic of) (cont'd)			– 3rd publication. Following an A2 Offenlegungsschrift or B2 Auslegeschrift	B	3
			– 4th publication. Following an A3 Offenlegungsschrift or B3 Auslegeschrift	B	4
	Patentschrift	Patent specification	Patent published in the sense of paragraph 6(ii)	C	
			– 1st publication. Offenlegungsschrift and Auslegeschrift not published	C	1
			– 2nd publication. Modified reprint normally following a B1 Auslegeschrift or C1 Patentschrift	C	2
			– 3rd publication. Normally following a B2 Auslegeschrift and an A1 Offenlegungsschrift or following a B2 Auslegeschrift with a preceding B1 Auslegeschrift as well	C	3
			– 4th publication. Following a B3 Auslegeschrift or C3 Patentschrift	C	4
			– 5th publication. Following a B4 Auslegeschrift or a C4 Patentschrift	C	5
	Gebrauchsmuster	Utility model	Utility model published in the sense of paragraph 6(ii)	U	
Hungary	Közzétett szabadalmi bejelentés	Published patent application	Patent application published in the sense of paragraph 6(i)	A	
	Szabadalmi leirás	Patent specification	Patent published in the sense of paragraph 6(ii)	B	
India	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Ireland	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Italy	Brevetto per invenzione industriale	Patent for industrial invention	Patent published in the sense of paragraph 6(ii)	A	

Annex C, page 13

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Japan	公開特許公報 (Kokai tokkyo koho)	Preliminary publication of patent	Patent application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	A	
	特許公報 (Tokkyo koho)	Patent publication	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	
	公開実用新案公報 (Kokai jitsuyo shinan koho)	Preliminary publication of Utility Model	Utility model application published before examination as to novelty in the sense of paragraph 6(i)	U	
	実用新案公報 (Jitsuyo shinan koho)	Utility Model publication	Utility model application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	Y	
Luxembourg	Brevet d'invention	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent published in the sense of paragraph 6(ii)	A	
Monaco	Brevet d'invention	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
Netherlands	Terinzagelegging	Patent application laid open	Patent application published in the sense of paragraphs 6(i) and 6(ii)	A	
	Openbaarmaking	Published patent application	Patent application published after examination in the sense of paragraphs 6(i) and 6(ii)	B	
	Octrooi	Patent	Patent published in the sense of paragraph 6(ii)	C	
Norway	Alment tilgjengelige patentsöknader (not marked on the document)	Patent application accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Utlegningsskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraph 6(ii)	B	

Annex C, page 14

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Norway (cont'd)	Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
Pakistan	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Poland			Patent application published in the sense of paragraph 6(i)	A	
	Opis patentowy Patentu tymczasowego	Description of patent	Patent published in the sense of paragraph 6(ii)	B	
Romania	Descrierea invenţiei	Description of the invention	Patent published in the sense of paragraph 6(ii)	A	
Soviet Union	ОПИСАНИЕ ИЗОБРЕТЕНИЯ К ПАТЕНТУ (Opisanie izobreteniya k patentu)	Description of the invention for a patent	Patent published in the sense of paragraph 6(ii)	A	
	ОПИСАНИЕ ИЗОБРЕТЕНИЯ К АВТОРСКОМУ СВИДЕТЕЛЬСТВУ (Opisanie izobreteniya k avtorskomu svidetelstvu)	Description of the invention for an author's certificate	Inventor's certificate published in the sense of paragraph 6(ii)	A	
Spain	Patente de invención	Patent of invention	Patent published in the sense of paragraph 6(i)	A	
	Patente de introducción	Patent of introduction	Patent of importation published in the sense of paragraph 6(i)	A	
	Certificado de adición	Certificate of addition	Certificate of addition published in the sense of paragraph 6(i)	A	
	Solicitud de Modelo de Utilidad	Application for a utility model	Utility Model Application published in the sense of paragraph 6(i)	U	
	Modelo de Utilidad	Utility Model	Utility Model published in the sense of paragraph 6(i)	Y	
Sweden	Allmänt tillgänglig patentansäkan	Patent application accessible to the public	Patent Application published in the sense of paragraph 6(i)	A	
	Utläggningsskrift	Document laid open	Patent Application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	

Annex C, page 15

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Sweden (cont'd)	Patentskrift	Patent document	Patent published in the sense of paragraph 6(ii)	C	
Switzerland	Auslegeschrift/Mémoire Exposé/Esposto Memoriale	Document laid open	Patent Application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii), and pertaining to the technical fields for which examination as to novelty is made, issued since 1959	A	4
	Patentschrift/Exposé d'invention/Esposto d'invenzione	Patent specification	Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which no examination as to novelty is made, issued since 1959	A	5
	Patentschrift/Exposé d'invention/Esposto d'inventione	Patent specification	Patent published in the sense of paragraph 6(ii) and pertaining to technical fields for which examination as to novelty is made, issued since 1959	B	5
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Hauptpatent/Brevet principal/Brevetto principale)	Patent specification (Main patent)	Patent published in the sense of paragraph 6(ii), issued from 1888 to 1959	A	
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Zusatzpatent/Brevet additionnel/Brevetto addizionale)	Patent specification (Additional patent)	Patent of addition published in the sense of paragraph 6(ii), issued from 1907 to 1959	A	
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Zusatzpatent/Brevet additionnel/Brevetto addizionale)	Patent specification (Additional patent)	Patent of addition published in the sense of paragraph 6(ii) in secondary series from 1888 to 1907	E	
United Kingdom	Patent Specification		Examined Patent Application published in the sense of paragraph 6(ii). Grant of letters Patent usually occurs 3 months after publication.	A	

Annex C, page 16

Issuing country	Kind of published patent document				
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document	Letter code	Associated numerical code (when defined)
United Kingdom (cont'd)	Amended Patent Specification		Amended Specification of a Granted Patent published in the sense of paragraph 6(ii)	B	
United States	Patent		Patent published in the sense of paragraph 6(ii)	A	
	Reissue Patent		Patent reissued and republished in the sense of paragraph 6(ii)	E	
	Defensive Publication		Patent application published without examination or assertion as to novelty, in the sense of paragraph 6(i)	H	
	Defensive Publication		Patent document published in the sense of paragraph 5: Entry of an abstract of the application in the Official Gazette	H	
	Defensive Publication		Patent document published in the sense of paragraph 6(ii): Abstract of an application published in a discrete document form distinctively numbered in a numerical series unique to Defensive Publications	H	
	Plant Patent		Patent published in the sense of paragraph 6(ii)	P	
Yugoslavia			Accepted Patent Application published in the sense of paragraph 6(i)	A	
	Patentni spis	Patent specification	Patent published in the sense of paragraph 6(ii)	B	

[Annex D follows]

ANNEX D

Information from Pamphlet Front Page to be Included in the Gazette Under Rule 86.1(i)

The following information shall be extracted from the front page of the pamphlet of each published international application and shall, in accordance with Rule 86.1(i), appear in the corresponding entry of the Gazette:

1. as to the international publication:
   - 1.1 the international publication number
   - 1.2 the date of the international publication
   - 1.3 an indication whether the following items were published in the pamphlet:
     - 1.31 international search report
     - 1.32 declaration under Article 17(2)
     - 1.33 amended claims
     - 1.34 statement under Article 19(1)
     - 1.35 the essence of the comments by the applicant on the translation of the international application as referred to in Rule 48.3*(b)*
2. as to the international application:
   - 2.1 the title of the invention
   - 2.2 the symbol(s) of the International Patent Classification (IPC)
   - 2.3 the international application number
   - 2.4 the international filing date
3. as to any priority claim:
   - 3.1 the application number of the earlier application
   - 3.2 the date of the earlier application
   - 3.3 the country in or for which the earlier application was filed
4. as to the applicant, inventor and agent:
   - 4.1 their name(s)
   - 4.2 their mailing address(es)
5. as to the designated and elected States:
   - 5.1 their names
   - 5.2 the indication of any wish for a regional patent
   - 5.3 the indication of kind of protection sought, unless patent is sought.

[Annex E follows]

ANNEX E

Information to be Published in the Gazette Under Rule 86.1(v)

1. The time limits applicable under Articles 22 and 39 in respect of each Contracting State.

2. The list of the non-patent literature agreed upon by the International Searching Authorities for inclusion in the minimum documentation.

3. The names of the national Offices which do not wish to receive copies under Article 13(2) *(c)*.

4. The provisions of the national laws of Contracting States concerning international-type search.

5. The text of the agreements entered into between the International Bureau and the International Searching Authorities or the International Preliminary Examining Authorities.

6. The names of the national Offices which entirely or in part waived their rights to any communication under Article 20.

7. The names of the Contracting States which are bound by Chapter II of the PCT.

8. Index of concordance of international application numbers and international publication numbers, listed according to international application numbers.

9. Index of international publication numbers grouped according to designated States, including an indication of those States for which a "regional patent" is sought.

10. Index of applicants' names giving, for each name, the corresponding international publication number(s).

11. Index of international publication numbers, grouped according to the International Patent Classification symbols.

12. Indication of any subject matter that will not be searched or examined by the various International Searching and Preliminary Examining Authorities under Rules 39 and 67.

[Annex F (Forms) follows]

ANNEX F

Forms

This Annex, which is the final Annex to the Administrative Instructions, contains the Forms referred to in Section 102 of the Administrative Instructions (Forms PCT/RO/101 to 132, PCT/ISA/201 to 228, PCT/IB/301 to 345 and PCT/IPEA/401 to 424).

In view of their special importance, Forms

PCT/RO/101	(Request and Fee Calculation Sheet)
PCT/ISA/210	(International Search Report)
PCT/IPEA/401	(Demand)
PCT/IPEA/409	(International Preliminary Examination Report)

have already been set up in type and appear at the beginning of Annex F and not in the place corresponding to their numerical order in the four different series of Forms.*

In order to facilitate familiarization with the different series of Forms, these series have been reproduced in the colors used previously, except for the four Forms set in type, mentioned above. However, there is no obligation on any International Authority to use any particular color for these Forms, nor any restriction as to the color it may use, except that the request must always be printed on white paper as prescribed by the Regulations.

* Having regard to the separate publication of Annex F mentioned in the footnote to Section 102 of the Administrative Instructions, only the four forms specified in this paragraph are reproduced in this publication.

INTERNATIONAL APPLICATION UNDER THE PATENT COOPERATION TREATY

REQUEST

THE UNDERSIGNED REQUESTS THAT THE PRESENT INTERNATIONAL APPLICATION BE PROCESSED ACCORDING TO THE PATENT COOPERATION TREATY

(The following is to be filled in by the receiving Office)
INTERNATIONAL APPLICATION No:

INTERNATIONAL FILING DATE:

(Stamp)
Name of receiving Office and "PCT International Application"

Applicant's or Agent's File Reference [9] (indicated by applicant if desired).

I. TITLE OF INVENTION [3]

II. APPLICANT [3] Additional information is contained in supplemental box. ☐

Name [4, 5]

Address [4, 5] (including postal code and country)

Nationality [4, 6] (country) | Residence [4, 7] (country)

Telephone number (if any) [4] | Telegraphic address (if any) [4, 8] | Teleprinter address (if any) [4, 8]

III. INVENTOR [3] (Applicant is also the inventor ☐) Additional information is contained in supplemental box. ☐

Name [4, 5]

Address [4, 5] (including postal code and country)

IV. AGENT OR COMMON REPRESENTATIVE (IF ANY) [3] Additional information is contained in supplemental box. ☐

A. ☐ Applicant hereby appoints the following named agent or common representative to act on his behalf before the competent International Authorities. [3]

B. ☐ Applicant has appointed the following named agent or common representative in accompanying separate power of attorney. [3]

Name [4, 5]

Address [4, 5] (including postal code and country).

Telephone number (if any) [4] | Telegraphic address (if any) [4, 8] | Teleprinter address (if any) [4, 8]

V. DESIGNATION OF STATES [10] (and possible indication of wish to obtain regional patents) [11] (and possible choice of certain kinds of protection) [12] Additional information is contained in supplemental box. ☐

RO use

VI. PRIORITY CLAIM (IF ANY) [13] Additional information is contained in supplemental box. ☐

The priority of an earlier application is claimed (indicate following data):

Country (If the earlier application is regional or international application, indicate those countries for which it was filed).	Filing Date [14]
	Application Number [15]
	If a regional or international application, indicate the national Office or intergovernmental organization with which it was filed.

VII. PARENT APPLICATION OR GRANT (IF ANY) [16] Additional information is contained in supplemental box. ☐

Designated State	Type of Treatment Desired	Number and Title of the Parent Application or Grant	Filing Date of the Parent Application or Grant [14]

VIII. EARLIER INTERNATIONAL OR INTERNATIONAL-TYPE SEARCH (IF ANY) [17] Additional information is contained in supplemental box. ☐

An earlier ☐ international or ☐ international-type search has been requested on the following application

Receiving Office/Country	(International) Application No.	(International) Filing Date [14]

Date of Request for the Search where the Earlier Search was an International-Type Search [14]	Number given by the International Searching Authority to the Request for Search where the Earlier Search was an International-Type Search

IX. DIFFERENT APPLICANTS FOR DIFFERENT (GROUPS OF) DESIGNATED STATES (WHERE APPLICABLE) [18]
Additional information is contained in supplemental box. ☐

Designated States	Name of Applicant

X. DIFFERENT INVENTORS FOR DIFFERENT (GROUPS OF) DESIGNATED STATES (WHERE APPLICABLE) [19]
Additional information is contained in supplemental box. ☐

Designated States	Name of Inventor

SUPPLEMENTAL BOX... USE THIS BOX IF ANY OF THE BOXES IS NOT LARGE ENOUGH TO CONTAIN INFORMATION TO BE FURNISHED. INDICATE THE BOXES CONTINUED IN THIS BOX BY THEIR (ROMAN) NUMERALS AND TITLE (e.g.: "II. APPLICANT (CONTINUED)")

XI. SIGNATURE OF APPLICANT [20]

XII. CHECK LIST (To be filled in by the Applicant) [21]

A. This international application contains the following number of sheets:

1. request	_____	sheets
2. description	_____	sheets
3. claims	_____	sheets
4. abstract	_____	sheets
5. drawings	_____	sheets
Total		sheets

C. Figure number _____ of the drawings (if any) is suggested to accompany the abstract for publication.

D. Drawings (To be filled in by the receiving Office)
☐ **No Drawings [22]**

B. This international application as filed is accompanied by the items checked below:

1. ☐ separate signed power of attorney
2. ☐ priority document
3. ☐ fee calculation sheet (PCT/RO/101 (Annex))
4. ☐ check for the payment of fees
5. ☐ international search report
6. ☐ international-type search report
7. ☐ document in evidence of fact that applicant is successor in title of inventor
8. ☐ other document (specify)

(The following is to be filled in by the receiving Office)

1. Date of actual receipt of the purported international application:
2. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
3. Date of timely receipt of the required corrections under Article 11 of the PCT:

(The following is to be filled in by the International Bureau)

Date of receipt of the record copy:

NOTES TO FORM PCT/RO/101

These Notes are intended to facilitate the filling in of the present form. For full information, see the text of the Patent Cooperation Treaty and the texts of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and the said texts, the latter are applicable. "Article" refers to Articles of the Treaty, "Rule" refers to Rules of the Regulations and "Section" refers to Sections of the Administrative Instructions.

1 **Title of Invention** (Rule 4.1 *(a)* (ii))

"The title of the invention shall be short (preferably from two to seven words when in English or translated into English) and precise." **(Rule 4.3)**

2 **Applicant** (Rule 4.1 *(a)* (iii))

"The request shall indicate the name, address, nationality and residence of the applicant or, if there are several applicants, of each of them." **(Rule 4.5 (a))**
"Where any international application indicates as applicants several persons, it shall be sufficient, for the purpose of identifying that application, to indicate, in any Form or correspondence relating to such application, the name of the applicant first named in the request." **(Section 105)**
See also box IX of the present form.

3 "Names of natural persons shall be indicated by the person's family name and given name(s), the family name being indicated before the given name(s)." **(Rule 4.4 (a))**
"Names of legal entities shall be indicated by their full, official designations." **(Rule 4.4 (b))**

4 "Addresses shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and, in any case, shall consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. It is recommended to indicate any telegraphic and teletype address and telephone number." **(Rule 4.4 (c))**
"For each applicant, inventor, or agent, only one address may be indicated." **(Rule 4.4 (d))**

5 "Where any name or address is written in characters other than those of the Latin alphabet, the same shall also be indicated in characters of the Latin alphabet either as a mere transliteration or through translation into English. The applicant shall decide which words will be merely transliterated and which words will be so translated." **(Rule 4.16 (a))**
"The name of any country written in characters other than those of the Latin alphabet shall also be indicated in English." **(Rule 4.16 (b))**

6 "The applicant's nationality shall be indicated by the name of the State of which he is a national." **(Rule 4.5 (b))**
See Section 201 in Note 10 below.

7 "The applicant's residence shall be indicated by the name of the State of which he is resident." **(Rule 4.5 (c))**
See Section 201 in Note 10 below.

8 **Inventor** (Articles 4 (1) *(v)* and 22 (1), Rules 4.1 *(a)* *(v)* and 4.6 *(a)*)

"The request shall contain: the name of and other prescribed data concerning the inventor where the national law of at least one of the designated States requires that these indications be furnished at the time of filing a national application. . . **(Article 4 (1) (v))**
"The applicant shall furnish a copy of the international application (unless the communication provided for in Article 20 has already taken place) and a translation thereof (as prescribed), and pay the national fee (if any), to each designated Office not later than at the expiration of 20 months from the priority date. Where the national law of the designated State requires the indication of the name of and other prescribed data concerning the inventor but allows that these indications be furnished at a time later than that of the filing of a national application, the applicant shall, unless they were contained in the request, furnish the said indications to the national Office of or acting for that State not later than at the expiration of 20 months from the priority date." **(Article 22 (1))**
"If the applicant is the inventor, the request, ...shall contain a statement to that effect or shall repeat the applicant's name in the space reserved for indicating the inventor." **(Rule 4.6 (b))**
See also box X of the present form.

9 **Agent or Common Representative** (Article 49, Rules 2.2, 4.1 *(a)* (iii), 4.7 and 4.8)

"Any attorney, patent agent, or other person, having the right to practice before the national Office with which the international application was filed, shall be entitled to practice before the International Bureau and the competent International Searching Authority and competent International Preliminary Examining Authority in respect of that application." **(Article 49)**
"Whenever the word "agent" is used, it shall be construed as meaning any person who has the right to practice before international authorities as defined in Article 49 and, unless the contrary clearly follows from the wording or the nature of the provision, or the context in which the word is used, also the common representative referred to in Rule 4.8." **(Rule 2.2)**
"If agents are designated, the request shall so indicate, and shall state their names and addresses." **(Rule 4.7)**
"If there is more than one applicant and the request does not refer to an agent representing all the applicants ("a common agent"), the request shall designate one of the applicants who is entitled to file an international application according to Article 9 as their common representative." **(Rule 4.8 (a))**
"If there is more than one applicant and the request does not refer to an agent representing all the applicants and it does not comply with the requirement of designating one of the applicants as provided in paragraph *(a)*, the applicant first named in the request who is entitled to file an international application according to Article 9 shall be considered the common representative." **(Rule 4.8 (b))**
"Appointment of any agent or of any common representative within the meaning of Rule 4.8 *(a)*, if the said agent or common representative is not designated in the request signed by all applicants, shall be effected in a separate signed power of attorney (i.e., a document appointing an agent or a common representative)." **(Rule 90.3 (a))**
"The power of attorney may be submitted to the receiving Office or the International Bureau. Whichever of the two is the recipient of the power of attorney submitted shall immediately notify the other and the interested International Searching Authority and the interested International Preliminary Examining Authority." **(Rule 90.3 (b))**
"If the separate power of attorney is not signed as provided in paragraph *(a)*, or if the required separate power of attorney is missing, or if the indication of the name or address of the appointed person does not comply with Rule 4.4, the power of attorney shall be considered non-existent unless the defect is corrected." **(Rule 90.3 (c))**
As for indications of names and addresses see Notes 3 and 4.
"International Authorities' means the receiving Offices, the International Searching Authorities, the International Preliminary Examining Authorities, and the International Bureau." **(Section 101 (vi))**
"Any correspondence from an International Authority intended for the applicant, or, in the case of several applicants, the applicants, shall be addressed as follows:"
"Where the applicant has designated or appointed one agent, correspondence shall be addressed to that agent. Where, in the case of several applicants, the applicants are represented by a common representative or a common agent, correspondence shall be addressed to that representative or that agent." **(Section 108 (a) (i))**
"Where the applicant has designated several agents in the request, correspondence shall be addressed to the agent first mentioned therein. Where, in the case of several applicants, the applicants have designated several common agents in the request, correspondence shall be addressed to the common agent first mentioned therein." **(Section 108 (a) (ii))**
"Where the applicant has appointed several agents in one or more separate powers of attorney, correspondence shall be addressed to the agent first mentioned in the earliest filed and still valid separate power of attorney. Where, in the case of several applicants, the applicants have appointed several common agents in one or more separate powers of attorney, correspondence shall be addressed to the common agent first mentioned in the earliest filed and still valid separate power of attorney." **(Section 108 (a) (iii))**
"Any correspondence from an International Authority to the applicant or his agent shall be marked with the file reference, composed either of letters or numbers, or both, of the applicant or the agent, if so indicated on the request form, provided this reference does not exceed ten characters **(Section 108 (b))**
"In the case of several applicants, any agent designated under Rule 4.7 in the request signed by all the applicants, or appointed under Rule 90.3 in a separate power of attorney signed by all the applicants, shall be considered a common agent." **(Section 106)**
"If there are several agents appointed by the same applicant or applicants, any act by or in relation to any of the several agents shall have the effect of an act by or in relation to the said applicant or applicants." **(Rule 90.2 (c))**
"If the applicants designate a common representative in accordance with Rule 4.8 *(a)*, such common representative shall be indicated on the front page of the request form. The indication of the common representative shall take the form of a statement designating the named applicant to act as the common representative on behalf of all the applicants." **(Section 206)**

10 **Designation of States** (Rule 4.1 *(a)* (iv))

"Contracting States shall be designated in the request by their names." **(Rule 4.9)**
"The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appears in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appears in *Annex B* (for example, where France is the third designated State in Box V of the request form, "FR 3. France" or "FR 3. French Republic")." **(Section 201 (a))**
"The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action." **(Section 201 (b))**
"If the applicant specifies the States to which he wishes any amount paid to be applied as designation fee, the amount shall be applied

accordingly to the number of States which are covered by the amount in the order specified by the applicant." **(Rule 15.5 (a))**

"If the applicant does not specify any such wish and if the amount or amounts received by the receiving Office are higher than the basic fee and one designation fee but lower than what is due according to the number of the designated States, any amount in excess of the basic fee and one designation fee shall be treated as designation fees for the States following the State first named in the request and in the order in which the States are designated in the request up to and including that designated State for which the total amount of the designation fee is covered by the amount or amounts received." **(Rule 15.5 (b))**

"The designation fee for the first mentioned State belonging to a group of States for which the same regional patent is sought and which is specified under paragraph *(a)* or which is reached under paragraph *(b)* shall, for the purposes of the said paragraphs, be considered as covering also the other States of the said group." **(Rule 15.5 (c))**

11 "The request shall, where applicable, contain: ...(iv) an indication that the applicant wishes to obtain a regional patent and the names of the designated States for which he wishes to obtain such a patent." **(Rule 4.1 (b) (iv))**

"Where the applicant wishes to obtain a regional patent in respect of any designated State, he shall make the indication in the request referred to in Rule 4.1 *(b)* (iv) by inserting the words "regional patent", or their equivalent in the language of the international application, immediately after the indication of the said State or, where an indication has been made under Section 202, after that indication, provided that:

(i) where Article 4 (1) (ii), third clause applies, and not all the States party to the regional treaty have been designated, the international application shall be treated as if all those States had been designated and as if the designations of all such States contained the said words, whether the said designations contained an indication of the wish to obtain a regional patent or, according to Article 4 (1) (ii), fourth clause, are to be treated as containing such indication;

(ii) where the national law of any designated State contains a provision as referred to in Article 45 (2), the International Bureau shall, according to Article 4 (1) (ii), fourth clause, treat the designation as if it contained the said words even where the applicant failed to indicate them." **(Section 203)**

12 "In respect of any designated or elected State whose law provides for the grant of inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, or utility certificates of addition, the applicant may indicate, as prescribed in the Regulations, that his international application is for the grant, as far as that State is concerned, of an inventor's certificate, a utility certificate, or a utility model, rather than a patent, or that it is for the grant of a patent or certificate of addition, an inventor's certificate of addition, or a utility certificate of addition, and the ensuing effect shall be governed by the applicant's choice. For the purposes of this Article and any Rule thereunder, Article 2 (ii) shall not apply." **(Article 43)**

"If the applicant wishes his international application to be treated, in any designated State, as an application not for a patent but for the grant of any of the other kinds of protection specified in Article 43, he shall so indicate in the request. For the purposes of this paragraph, Article 2 (ii) shall not apply." **(Rule 4.12 (a))**

"Where the applicant wishes his application to be treated in any designated State as an application not for a patent but for the grant of another kind of protection referred to in Article 43, he shall make the indication in the request referred to in Rule 4.12 *(a)* by inserting the words "inventor's certificate", "utility certificate", "utility model", "patent of addition", "certificate of addition", "inventor's certificate of addition" or "utility certificate of addition", or their equivalent in the language of the international application, immediately after the indication of the said State." **(Section 202 (a))**

"In respect of any designated or elected State whose law permits an application, while being for the grant of a patent or one of the other kinds of protection referred to in Article 43, to be also for the grant of another of the said kinds of protection, the applicant may indicate, as prescribed in the Regulations, the two kinds of protection he is seeking, and the ensuing effect shall be governed by the applicant's indications. For the purposes of this Article, Article 2 (ii) shall not apply." **(Article 44)**

"Where the applicant is seeking two kinds of protection under Article 44, he shall make the indication in the request referred to in Rule 4.12 *(b)* by inserting, immediately after the indication of the said State and in the language of the international application, either

(i) any two of the following terms connected by the word "and": "patent", "inventor's certificate", "utility certificate", "utility model", "patent of addition", "certificate of addition", "inventor's certificate of addition", "utility certificate of addition"; or

(ii) any two of the terms indicated in (i), above, one of them preceded by the word "primarily" and the other by the word "subsidiarily"." **(Section 202 (b))**

13 **Priority Claim** (Rules 4.1 *(b)* (i) and 4.10)

14 "Any date in the international application, or used in any correspondence emanating from International Authorities relating to the international application, shall be indicated by the Arabic number of the day, by the name of the month, and by the Arabic number of the year. The receiving Office, where the applicant has not done so, or the International Bureau, where the applicant has not done so and the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by two-digit Arabic numerals each for the number of the day, for the number of the month and for the last two numbers of the year, in that order and with a period after the digit pairs of the day and of the month (for example, "30 March 1978 (30.03.78)")." **(Section 110)**

15 "If the application number of the earlier application is not indicated in the request but is furnished by the applicant to the International Bureau prior to the expiration of the 16th month from the priority date, it shall be considered by all designated States to have been furnished in time. If it is furnished after the expiration of that time limit, the International Bureau shall inform the applicant and the designated Offices of the date on which the said number was furnished to it. ..." **(Rule 4.10 (c))**

16 **Parent Application or Grant** (Rule 4.1 *(b)* (v))

"If the applicant wishes his international application to be treated, in any designated State, as an application for a patent or certificate of addition, inventor's certificate of addition, or utility certificate of addition, he shall identify the parent application or the parent patent, parent inventor's certificate, or parent utility certificate to which the patent or certificate of addition, inventor's certificate of addition, or utility certificate of addition, if granted, relates. For the purposes of this paragraph, Article 2 (ii) shall not apply." **(Rule 4.13)**

"If the applicant wishes his international application to be treated, in any designated State, as an application for a continuation or a continuation-in-part of an earlier application, he shall so indicate in the request and shall identify the parent application involved." **(Rule 4.14)**

17 **Earlier International or International-Type Search** (Rule 4.1 *(b)* (ii))

"If an international or international-type search has been requested on an application under Article 15 (5), the request may state that fact and identify the application (or its translation, as the case may be) by country, date and number, and the request for the said search by date and, if available, number." **(Rule 4.11)**

18 **Different Applicants for Different (Groups of) Designated States** (Rule 18.4)

"The international application may indicate different applicants for the purposes of different designated States, provided that, in respect of each designated State, at least one of the applicants indicated for the purposes of that State is entitled to file an international application according to Article 9." **(Rule 18.4 (a))**

19 **Different Inventors for Different (Groups of) Designated States**

"The request may, for different designated States, indicate different persons as inventors where, in this respect, the requirements of the national laws of the designated States are not the same. In such a case, the request shall contain a separate statement for each designated State or group of States in which a particular person, or the same person, is to be considered the inventor, or in which particular persons, or the same persons, are to be considered the inventors." **(Rule 4.6 (c))**

20 **Signature**

The signature **(Rule 4.1 (d))** must be that of the applicant and if there are several applicants all must sign **(Rule 4.15)**; however, the signature may be that of the agent **(Rule 2.1)** where there is attached to this request a separate power of attorney appointing the agent. "Appointment of any agent or of any common representative within the meaning of Rule 4.8 *(a)*, if the said agent or common representative is not designated in the request signed by all applicants, shall be effected in a separate signed power of attorney (i.e., a document appointing an agent or a common representative)." **(Rule 90.3 (a))**

21 **Check List**

"*(a)* The printed form shall contain a list which, when filled in, will show:

(i) the total number of sheets constituting the international application and the number of the sheets of each element of the international application (request, description, claims, drawings, abstract);

(ii) whether or not the international application as filed is accompanied by a power of attorney (i.e., a document appointing an agent or a common representative), a priority document, a receipt for the fees paid or a check for the payment of the fees, an international or an international-type search report, a document in evidence of the fact that the applicant is the successor in title of the inventor, and any other document (to be specified in the check list);

(iii) the number of that figure of the drawings which the applicant suggests should accompany the abstract when the abstract is published on the front page of the pamphlet and in the Gazette; in exceptional cases, the applicant may suggest more than one figure.

(b) The list shall be filled in by the applicant, failing which the receiving Office shall fill it in and make the necessary annotations, except that the number referred to in paragraph *(a)* (iii) shall not be filled in by the receiving Office." **(Rule 3.3)**

22 **Missing Drawings** (Rule 26.6)

"*(a)* If, as provided in Article 14(2), the international application refers to drawings which in fact are not included in that application, the receiving Office shall so indicate in the said application." **(Rule 26.6 (a))**

"Where the international application refers to drawings which in fact are not included in that application, the receiving Office shall make the indication referred to in Rule 26.6 *(a)* by an appropriate marking of the request form." **(Section 310 (a))**

THIS SHEET DOES NOT COUNT AS A PAGE OF THE INTERNATIONAL APPLICATION

APPLICANT		DOCKET NUMBER	This column for use by receiving Office
RO/US RECEIPT DATE	INTERNATIONAL APPLICATION NUMBER	SUBMISSION DATE	

UNITED STATES RECEIVING OFFICE
FEE CALCULATION SHEET[1]

FEES SUBMITTED OR AUTHORIZED:

I. TRANSMITTAL FEE[2] ..... ① T

II. SEARCH FEE[3] ..... ② S

III. INTERNATIONAL FEE[4]

BASIC FEE[5]

Indicate the number of SHEETS contained in the international application _____.

first 30 sheets ..... ③ b_1

remaining _____ sheets x④ $ _____ = b_2

Add amounts entered in boxes b_1 and b_2 and enter total in box B.
This figure is the amount of the BASIC FEE ..... B

DESIGNATION FEES[6]

Indicate the number of DESIGNATED STATES
for which regional patents have not been sought _____ x⑤ $ _____ = d_1

Indicate the number of GROUPS of designated
States for which regional patents have been sought _____ x⑤ $ _____ = d_2

—Note designation fee instructions below—

Add amounts entered in boxes d_1 and d_2 and enter total in box D.
This figure is the amount of the DESIGNATION FEES ..... D

Add amounts entered in boxes B and D, and enter total in box I.
This figure is the amount of the INTERNATIONAL FEE I

IV. TOTAL FEES SUBMITTED OR AUTHORIZED:

Add amounts entered in boxes T, S and I, and enter total in the total box. This figure is the total amount of the FEES SUBMITTED or AUTHORIZED ..... TOTAL

Payment must be made in United States currency. Checks, postal money orders or bank drafts must be made payable to the Commissioner of Patents and Trademarks. Payment may also be made by authorization to charge to a Patent and Trademark Office deposit account. ①–⑥: *FEE AMOUNTS LISTED ON REVERSE SIDE.*

DEPOSIT ACCOUNT AUTHORIZATION[7]

☐ The RO/US is hereby authorized to charge the total fees indicated above to my deposit account.

☐ The RO/US is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

Deposit Account Number *Date* *Signature*

INSTRUCTIONS REGARDING DESIGNATION FEES: *(See reverse side for list of member States)*

Use the space below to indicate, in order, those countries for which the designation fees submitted or authorized are to be applied. Include after the name of the country any indication that a regional patent is sought. If no countries are indicated below, the RO/US will apply the designation fees submitted or authorized to the designated countries in the order in which those countries are listed in the Request.

NOTES TO FORM PCT/RO/101 (ANNEX) (U.S. VERSION)

1 The purpose of the fee calculation sheet is to aid the applicant in calculating fees that are submitted to the receiving Office for the processing of the international application. It is strongly recommended that the applicant complete the form and submit it to the receiving Office both upon filing and with any later submission of designation fees. This will help the receiving Office to verify the calculations.

2 "Any receiving Office may require that the applicant pay a fee to it, for its own benefit, for receiving the international application, transmitting copies to the International Bureau and the competent International Searching Authority, and performing all the other tasks which it must perform in connection with the international application in its capacity of receiving Office ("transmittal fee")." (PCT Rule 14.1(a))

"The amount and the due date of the transmittal fee, if any, shall be fixed by the receiving Office." (PCT Rule 14.1(b))

THE TRANSMITTAL FEE MUST BE PAID IN FULL UPON FILING. (35 U.S.C. 361(d))

3 "Each International Searching Authority may require that the applicant pay a fee ("search fee") for its own benefit for carrying out the international search and for performing all other tasks entrusted to International Searching Authorities by the Treaty and these Regulations." (PCT Rule 16.1 (a))

"The search fee shall be collected by the receiving Office. It shall be payable in the currency prescribed by that Office, it being understood that, if that currency is not the same as the currency of the State in which the International Searching Authority is located, the search fee, when transferred by the receiving Office to that Authority, shall be freely convertible into the currency of the said State. As to the time of payment of the search fee, Rule 15.4(a) shall apply." (PCT Rule 16.1 (b))

THE SEARCH FEE MUST BE PAID IN FULL ON FILING. (35 U.S.C. 361(d))

4 "Each international application shall be subject to the payment of a fee for the benefit of the International Bureau ("international fee") consisting of:

(i) a "basic fee," and

(ii) as many "designation fees" as there are States designated in the international application, provided that, where a regional patent is sought for certain designated States, only one designation fee shall be due for those States." (PCT Rule 15.1)

5 "The amount of the basic fee shall be:

(i) if the international application contains not more than 30 sheets: US $165.00 or 300 Swiss francs,

(ii) if the international application contains more than 30 sheets: US $165.00 or 300 Swiss francs plus US $3.00 or 6 Swiss francs per sheet in excess of 30 sheets." (PCT Rule 15.2(a))

THE BASIC FEE MUST BE PAID IN FULL UPON FILING IN UNITED STATES CURRENCY. (35 U.S.C. 361(d), 376 (a))

6 "The amount of the designation fee shall be for each designated state or each group of designated States for which the same regional patent is sought: US $40.00 or 80 Swiss francs. (PCT Rule 15.2(b))

THE DESIGNATION FEES MAY BE PAID ON FILING, BUT MUST BE PAID NO LATER THAN ONE YEAR FROM THE PRIORITY DATE. THOSE DESIGNATIONS FOR WHICH FULL PAYMENT IS NOT RECEIVED BY ONE YEAR FROM THE PRIORITY DATE WILL BE CONSIDERED WITHDRAWN. (PCT Rule 15.4(b))

THE DESIGNATION FEE MUST BE PAID IN UNITED STATES CURRENCY. (35 U.S.C. 376(a))

7 The RO/US will not charge fees to a deposit account unless an authorization, including signature and account number, is provided.

FEE AMOUNTS (as of 01 June 1978)

①	Transmittal Fee	$ 35.00
②	Search Fee	300.00
③	Basic Fee First 30 sheets	165.00
④	Basic Fee Each sheet over 30	3.00
⑤	Designation Fee Each State or group of States for which the same regional patent is sought	40.00

Caution: The above fees are subject to change. Consult the OFFICIAL GAZETTE of the United States Patent and Trademark Office for the current fee amounts.

PCT MEMBER STATES WHICH MAY BE DESIGNATED (as of 01 June 1978)

Code	Short Official Title
BR	Brazil
CM	Cameroon*
CF	Central African Empire*
TD	Chad*
CG	Congo*
FR	France**
GA	Gabon*
DE	Germany, Federal Republic of**
LU	Luxembourg**
MG	Madagascar
MW	Malawi
SN	Senegal*
SU	Soviet Union
SE	Sweden**
CH	Switzerland**
TG	Togo*
GB	United Kingdom **
US	United States of America

*Members of OAPI Regional Patent System

** Members of EPC Regional Patent System

Caution: The above Member States may limit the type of national or regional patent protection available through PCT. Consult the OFFICIAL GAZETTE of the United States Patent and Trademark Office for further information. The GAZETTE will also list additional Member States as they ratify PCT.

PATENT COOPERATION TREATY
INTERNATIONAL SEARCH REPORT

IDENTIFICATION OF INTERNATIONAL APPLICATION	Applicant's or Agent's File Reference [19]
International Application No. [1]	International Filing Date [2]
Receiving Office [3]	Priority Date Claimed [3]
Applicant [4]	

I. ☐ CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10] (Observations on supplemental sheet (2))

II. ☐ UNITY OF INVENTION IS LACKING [11] (Observations on supplemental sheet (2))

III. TITLE, ABSTRACT AND FIGURE OF DRAWING

1. The following indicated items are approved as submitted by the applicant: [6]
   ☐ Title. ☐ Abstract.
2. The texts established by this International Searching Authority of the following indicated items are set forth below:
   ☐ Title.
   ☐ Abstract.

☐ Text of the abstract continued on supplemental sheet (1)

3. ☐ This report is incomplete as far as the abstract is concerned as the time limit for comments by the applicant on the draft prepared by this International Searching Authority has not expired. [7]

4. The figure of the drawings indicated below is to be published with the abstract:
   ☐ Figure No._____as suggested by the applicant. [8]
   Figure No _____because:
   ☐ applicant failed to suggest a figure. [9]
   ☐ this figure better characterizes the invention. [9]

Form PCT/ISA/210 (first sheet) (October 1977) See notes on accompanying sheet

International Application No

FURTHER INFORMATION CONTINUED FROM THE FIRST SHEET
(Not for publication)

INTERNATIONAL SEARCH REPORT

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]

* Special categories of cited documents: [15]

"A" document defining the general state of the art

"E" earlier document but published on or after the international filing date

"L" document cited for special reason other than those referred to in the other categories

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but on or after the priority date claimed

"T" later document published on or after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention

"X" document of particular relevance

IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
International Searching Authority [1]	**Signature of Authorized Officer** [20]

Form PCT/ISA/210 (second sheet) (October 1977) See notes on accompanying sheet

International Application No.

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter [13] not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out [14], specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [11]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

NOTES TO FORM PCT/ISA/210

These Notes are intended to facilitate the use of the present form. For full information, see the text of the Patent Cooperation Treaty and the texts of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and the said texts, the latter are applicable. "Article" refers to Articles of the Treaty, "Rule" refers to Rules of the Regulations and "Section" refers to Sections of the Administrative Instructions.

1 "The international search report shall identify the International Searching Authority which established it by indicating the name of such Authority, and the international application by indicating the international application number, the name of the applicant, the name of the receiving Office, and the international filing date." **(Rule 43.1)**

2 "The international search report shall be dated and shall indicate the date on which the international search was actually completed. It shall also indicate the filing date of any earlier application whose priority is claimed." **(Rule 43.2)**

3 "The international search report shall contain the classification of the subject matter at least according to the International Patent Classification." **(Rule 43.3 (a))**
"Such classification shall be effected by the International Searching Authority." **(Rule 43.3 (b))**
"Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols." **(Section 504 (a))**
"Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system." **(Section 504 (b))**
"Where the subject matter of the international application is classified both according to the International Patent Classification and to any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other." **(Section 504 (c))**

4 "The international search report shall list the classification identification of the fields searched. If that identification is effected on the basis of a classification other than the International Patent Classification, the International Searching Authority shall publish the classification used." **(Rule 43.6 (a))**

5 "If the international search extended to patents, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, utility certificates of addition, or published applications for any of those kinds of protection, of States, periods, or languages, not included in the minimum documentation as defined in Rule 34, the international search report shall, when practicable, identify the kinds of documents, the States, the periods, and the languages to which it extended. For the purposes of this paragraph, Article 2 (ii) shall not apply." **(Rule 43.6 (b))**

6 "Subject to paragraphs *(b)* and *(c)*, the international search report shall either state that the International Searching Authority approves the title and the abstract as submitted by the applicant or be accompanied by the text of the title and/or abstract as established by the International Searching Authority under Rules 37 and 38." **(Rule 44.2 (a))**

7 "If, at the time the international search is completed, the time limit allowed for the applicant to comment on any suggestion of the International Searching Authority in respect of the abstract has not expired, the international search report shall indicate that it is incomplete as far as the abstract is concerned". **(Rule 44.2 (b))**

8 The figure(s) suggested by the applicant is indicated in the check list of the request; see **Rule 3.3 (a) (iii)**.

9 "If the applicant fails to make the indication referred to in Rule 3.3 *(a)* (iii), or if the International Searching Authority finds that a figure or figures other than that figure or those figures suggested by the applicant would among all the figures of all the drawings, better characterize the invention, it shall indicate the figure or figures which it so considers. Publications by the International Bureau shall then use the figure or figures so indicated by the International Searching Authority. Otherwise, the figure or figures suggested by the applicant shall be used in the said publications." **(Rule 8.2)**

10 This part of the report is filled in only where Article 17 (2) *(b)* applies. (Where certain claims were not searched because of lack of unity of invention and non-payment of additional fees, part V—rather than this part—is filled in.) **Article 17 (2)** reads as follows:

"*(a)* If the International Searching Authority considers

(i) that the international application relates to a subject matter which the International Searching Authority is not required, under the Regulations, to search, and in the particular case decides not to search, or

(ii) that the description, the claims, or the drawings, fail to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out,

the said Authority shall so declare and shall notify the applicant and he International Bureau that no international search report will be established.

"*(b)* If any of the situations referred to in subparagraph *(a)* is found to exist in connection with certain claims only, the international search report shall so indicate in respect of such claims, whereas, for the other claims, the said report shall be established as provided in Article 18."

11 This part of the report is filled in only where, in the course of the procedure preceding the issuance of this report the International Searching Authority, having found that the international application does not comply with the requirement of unity of invention, invites the applicant to pay additional fees. See **Article 17 (3) (a)** reading as follows:
"If the International Searching Authority considers that the international application does not comply with the requirement of unity of invention as set forth in the Regulations, it shall invite the applicant to pay additional fees. The International Searching Authority shall establish the international search report on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and, provided the required additional fees have been paid within the prescribed time limit, on those parts of the international application which relate to inventions in respect of which the said fees were paid."
"If the applicant paid additional fees for the international search, the international search report shall so indicate. Furthermore, where the international search was made on the main invention only (Article 17 (3) *(a)*), the international search report shall indicate what parts of the international application were and what parts were not searched." **(Rule 43.7)**

12 See **Article 17 (2) (a) (i)**, quoted in note **10**, above, and **Rule 39** reading as follows:
"No International Searching Authority shall be required to search an international application if, and to the extent to which, its subject matter is any of the following:

(i) scientific and mathematical theories,

(ii) plant or animal varieties or essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes,

(iii) schemes, rules or methods of doing business, performing purely mental acts or playing games,

(iv) methods for treatment of the human or animal body by surgery or therapy, as well as diagnostic methods,

(v) mere presentations of information,

(vi) computer programs to the extent that the International Searching Authority is not equipped to search prior art concerning such programs."

13 See **Article 17 (2) (a) (ii)**, quoted in note **10**, above.

14 "The objective of the international search is to discover relevant prior art." **(Article 15 (2))**
Rule 33.1, entitled "Relevant Prior Art for the International Search," reads as follows:
"*(a)* For the purposes of Article 15 (2), relevant prior art shall consist of everything which has been made available to the public anywhere in the world by means of written disclosure (including drawings and other illustrations) and which is capable of being of assistance in determining that the claimed invention is or is not new and that it does or does not involve an inventive step (i.e., that it is or is not obvious), provided that the making available to the public occurred prior to the international filing date.
"*(b)* When any written disclosure refers to an oral disclosure, use, exhibition, or other means whereby the contents of the written disclosure were made available to the public, and such making available to the public occurred on a date prior to the international filing date, the international search report shall separately mention that fact and the date on which it occurred if the making available to the public of the written disclosure occurred on a date posterior to the international filing date.
"*(c)* Any published application or any patent whose publication date is later but whose filing date, or, where applicable, claimed priority date, is earlier than the international filing date of the international application searched, and which would constitute relevant prior art for the purposes of Article 15 (2) had it been published prior to the international filing date, shall be specially mentioned in the international search report."

15 "Where any document cited in the international search report is of particular relevance, the special indication required by Rule 43.5 *(c)* shall consist of the letter "X" placed next to the citation of the said document." **(Section 505)**
"Where any document cited in the international search report refers to an oral disclosure, use, exhibition, or other means referred to in Rule 33.1 *(b)*, the separate indication required by that Rule shall

consist of the letter "O" placed next to the citation of the said document." (Section 507 (a))

"Where any document cited in the international search report is a published application or patent as defined in Rule 33.1 *(c)*, the special mention required by that Rule shall consist of the letter "E" placed next to the citation of the said document." (Section 507 (b))

"Where any document cited in the international search report is a document which defines the general state of the art, it shall be indicated by the letter "A" placed next to the citation of the said document." (Section 507 (c))

"Where any document cited in the international search report is a document whose publication date occurred earlier than the international filing date of the international application, but later than the priority date claimed in that application, it shall be indicated by the letter "P" next to the citation of the said document." (Section 507 (d))

"Where any document cited in the international search report is a document whose publication date occurred after the filing date or the priority date of the international application and is not in conflict with the said application, but is cited for the principle or theory underlying the invention, which may be useful for a better understanding of the invention, or is cited to show that the reasoning or the facts underlying the invention are incorrect, it shall be indicated by the letter «T» next to the citation of the document." (Section 507 (e))

"Where in the international search report any document is cited for reasons other than those referred to in the preceding paragraphs, such document shall be indicated by the letter «L» next to the citation of the document." (Section 507 (f))

16 "The international search report shall contain the citations of the documents considered to be relevant." (Rule 43.5 (a))

"Identification of any document cited in the international search report referred to in Rule 43.5 *(b)* shall be made by indicating the following elements in the order in which they are listed:

(a) *In the case of any patent document* (patent documents being patents within the meaning of Article 2 (ii) as well as published applications relating thereto):

(i) the Office that issued the document, by the two-letter code as in *Annex B*;

(ii) the kind of document, by the appropriate symbols as in *Annex C*;

(iii) the number of the document as given to it by the Office that issued it; (for Japanese patent documents the indication of the year of the reign of the Emperor must precede the serial number of the patent document);

(iv) the date of publication of the cited patent document as indicated thereon;

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings; and

(vi) the name of the patentee or applicant.

(The following example illustrates the citation of a patent document according to paragraph (a) above:

JA, B, 5014535, published 1975, May 28, see column 4, lines 3 to 27, NCR Corporation.)

(b) *In the case of any book or other separately issued publication*

(i) the name of the author;

(ii) the title (including, where applicable, the number of the edition and/or volume);

(iii) the year of publication (when this coincides with the year of the international application or of the priority claim, the International Searching Authority shall endeavour to determine the month and, if necessary, the day of publication and to indicate these data in the international search report);

(iv) the name of the publisher;

(v) as far as available, the place of publication (where only the location of the publisher appears on the book or other separately issued publication, then that location shall be indicated as the place of publication); and

(vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a book or other separately issued publication according to paragraph (b) above:

H. Walton, 'Microwave Quantum Theory', Volume 2, published 1973, by Sweet and Maxwell (London), see pages 138 to 192, especially pages 146 to 148.)

(c) *In the case of any article published in a periodical or other serial publication:*

(i) the title of the periodical or other serial publication;

(ii) the number of the volume and the date of the issue in which the article appears;

(iii) as far as available, the place of publication (where only the location of the publisher appears in the periodical or other serial publication, then that location shall be indicated as the place of publication);

(iv) the author and the title of the article and the number of the page both on which the article starts and ends; and

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of an article published in a periodical or other serial publication according to paragraph (c) above:

IBM Technical Disclosure Bulletin, Volume 17, no. 5, issued 1974 October (Armonk, New York), J. G. Drop, 'Integrated Circuit Personalization at the Module Level', see pages 1344 to 1345.)

(d) *In the case of abstracts*

(i) the identification of the document containing the abstract in the manner set forth in paragraphs *(a)*, *(b)* and *(c)*, respectively, depending upon whether the abstract is contained in a patent document, in a book or other separately issued publication, or in an article published in a periodical or other serial publication;

(ii) in the case where the abstract is not published together with the full text document which served as its basis, the identification of both abstract and full text document on the basis of whatever bibliographic data may be available in respect thereto."

(The following example illustrates the citation of an abstract according to paragraph *(d)* (ii) above:

Chemical Abstracts, Volume 75, no. 20, issued 1971, November 15 (Colombus, Ohio, U.S.A.), D. I. Shetulov, 'Surface Effects During Metal Fatigue' see page 163, column 1, the abstract no. 120718k, Fiz.-Khim. Mekh. Mater. 1971,7(2), 7-11 (Russ).)" (Section 503)

17 "If only certain passages of the cited document are relevant or particularly relevant, they shall be identified, for example, by indicating the page, the column, or the lines, where the passage appears." (Rule 43.5 (e))

18 "Citations which are not relevant to all the claims shall be cited in relation to the claim or claims to which they are relevant." (Rule 43.5 (d))

"The claims to which cited documents are relevant shall be indicated by placing in the appropriate column of the international search report:

(i) where the cited document is relevant to one claim, the number of that claim; for example, (2) or (17);

(ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen; for example, (1-15) or (2-3);

(iii) where the cited document is relevant to two or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example, (1,6) or (1,7,10);

(iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1-6, 9-10, 12-15) or (1, 3-4, 6, 9-11)." (Section 508)

19 "Any correspondence from an International Authority to the applicant or his agent shall be marked with the file reference, composed either of letters or numbers, or both, of the applicant or the agent, if so indicated on the request form, provided this reference does not exceed ten characters." (Section 108 (b))

20 "The international search report shall be signed by an authorized officer of the International Searching Authority." (Rule 43.8)

(78) UPDATE OF INFORMATION CONCERNING THE PATENT COOPERATION TREATY

TOPIC 1: INCREASE IN INTERNATIONAL FEES EFFECTIVE AUGUST 1, 1979

Effective August 1, 1979, any international fees (basic and designation fees) for the processing of International applications must be paid in the revised amounts indicated below.

The amount of the basic fee portion of the International fee under PCT Rule 15.1(i) is being increased from $165 to $190 for an international application containing 30 sheets or less, effective August 1, 1979.

The amount of the supplement fee to the basic fee for each page of the international application in excess of 30 sheets is being raised from the current $3 per page to $3.50 per page, effective August 1, 1979.

The amount of the designation fee portion of the International fee under PCT Rule 15.1(ii) is being raised from $40 to $45, effective August 1, 1979.

These fee increases were adopted by the PCT Assembly on May 1, 1979 to help cover the operating costs of the International Bureau. There is no change in the $35 transmittal fee or $300 search fee which are set by the Commissioner of Patents and Trademarks. Applicants are reminded that the basic fee and any supplement to the basic fee must be paid in full upon filing to avoid withdrawal of the International application. The use of deposit accounts and specifically the authorization for the United States Receiving Office to use deposit accounts to correct any deficiency in PCT fees is strongly encouraged.

TOPIC 2: LIST OF CONTRACTING STATES AS OF MAY 25, 1979

State	*Ratification or Accession*	*Date of Ratification or Accession*	*Date From Which State May Be Designated*
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

** Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought.

TOPIC 3: CHANGES IN THE PCT RULES

The following PCT Rule changes, adopted by the PCT Assembly on May 1, 1979 become effective on August 1, 1979 with the exception of the changes in PCT Rule 47 which became available on May 1, 1979.

RULE 15

The International Fee

15.1 *Basic Fee and Designation Fee*

Each international application shall be subject to the payment of a fee for the benefit of the International Bureau ("international fee") to be collected by the receiving Office and consisting of,

(i) a "basic fee," and

(ii) as many "designation fees" as there are national patents and regional patents sought by the applicant in the international application, except that, where Article 44 applies in respect of a designation, only one designation fee shall be due.

15.2 *Amounts*

(a) The amounts of the basic fee and of the designation fee are as set out in the Schedule of Fees.

(b) The amounts of the basic fee and of the designation fee shall be established, for each receiving Office which, under Rule 15.3, prescribes the payment of those fees in a currency or currencies other than Swiss currency, by the Director General after consultation with that Office and in the currency or currencies prescribed by that Office ("prescribed currency"). The amounts in each prescribed currency shall be the equivalent, in round figures, of the amounts in Swiss currency set out in the Schedule of Fees. They shall be published in the Gazette.

(c) Where the amounts of the fees set out in the Schedule of Fees are changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amounts set out in the amended Schedule of Fees.

(d) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish new amounts in the prescribed currency according to directives given by the Assembly. The newly established amounts shall become applicable two months after the date of their publication in the Gazette, provided that the interested Office and the Director General may agree on a date falling amounts shall become applicable for that Office from that date.

15.3 *Mode of Payment*

The international fee shall be payable in the currency or currencies prescribed by the receiving Office, it being understood that, when transferred by the receiving Office to the International Bureau, the amount transferred shall be freely convertible into Swiss currency.

15.4 *Time of Payment*

(a) Subject to paragraph (c), the basic fee shall be due on the date of receipt of the international application.

(b) Subject to paragraph (c), the designation fee shall be paid on the date of receipt of the international application or on any later date prior to the expiration of one year from the priority date.

(c) The receiving Office may permit applicants to pay either the basic fee or the designation fee or both of the fees later than on the dates provided for in paragraphs (a) and (b), provided that:

(i) permission shall not be given to pay the basic fee or the designation fee later than one month after the date of receipt of the international application;

(ii) permission may not be subject to any extra charge. Such later payment of the said fees shall be without loss, in the case of the basic fee, of the international filing date, or, in the case of the designation fee, of the designations to which the payment relates.

15.5 *Partial Payment*

(a) Where the amount of the international fee received by the receiving Office is not less than that of the basic fee and at least one designation fee but less than the amount required to cover the basic fee and all the designations made in the international application, the amount received shall be applied as follows:

(i) to cover the basic fee, and

(ii) to cover as many designation fees as, after deduction of the basic fee, may be covered in full by the amount received in the order indicated in paragraph (b).

(b) The order in which the said amount shall be applied to the designations shall be established as follows:

(i) where the applicant indicates to which designation or designations the amount is to be applied, it shall be applied accordingly but, if the amount received is insufficient to cover the designations indicated, it shall be applied to as many designations as are covered by it in the order chosen by the applicant in indicating the designations;

(ii) to the extent that the applicant has not given the indications under item (i), the amount or the balance thereof shall be applied to the designations in the order in which they appear in the international application;

(iii) where the designation of a State is for the purposes of a regional patent and provided that the required designation fee is, under the preceding provisions available for that designation, the designation of any further States for which the same regional patent is sought shall be considered as covered by that fee.

15.6: [No change]

RULE 16

The Search Fee

16.1 *Right to Ask for a Fee*

(a) [No change]

(b) The search fee shall be collected by the receiving Office. The said fee shall be payable in the currency or currencies prescribed by that Office ("the receiving Office currency"), it being understood that, if any receiving Office currency is not that, or one of those, in which the International Searching Authority has fixed the said fee ("the fixed currency or currencies"), it shall, when transferred by the receiving Office to the International Searching Authority, be freely convertible into the currency of the State in which the International Searching Authority has its headquarters ("the headquarters currency"). The amount of the search fee in any receiving Office currency, other than the fixed currency or currencies, shall be established by the Director General after consultation with that Office. The amounts so established shall be the equivalents, in round figures, of the amount established by the International Searching Authority in the headquarters currency. They shall be published in the Gazette.

(c) Where the amount of the search fee in the headquarters currency is changed, the corresponding amounts in the receiving Office currencies, other than the fixed currency or currencies, shall be applied from the same date as the changed amount in the headquarters currency.

(d) Where the exchange rate between the headquarters currency and any receiving Office currency, other than the fixed currency or currencies, becomes different from the exchange rate last applied, the Director General shall establish the new amount in the said receiving Office currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that any interested receiving Office and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Office from that date.

(e) Where, in respect of the payment of the search fee in a receiving Office currency, other than fixed currency or currencies, the amount actually received by the International Searching Authority in the headquarters currency is less than that fixed by it, the difference will be paid to the International Searching Authority by the International Bureau, whereas, if the amount actually received is more, the difference will belong to the International Bureau.

(f) As to the time of payment of the search fee, the provisions of Rule 15.4 relating to the basic fee shall apply.

16.2: [No change]

16.3: [No change]

RULE 47

Communication to Designated Offices

47.1 *Procedure*

(a) [No change]

(b) Such communication shall be effected promptly after the international publication of the international application and, in any event, by the end of the 19th month after the priority date. Where the time limit under Rule 46.1 has not expired when the communication is effected and the International Bureau has neither received amendments from the applicant nor a declaration that the applicant does not wish to make amendments before the International Bureau, the International Bureau shall, at the time of the communication, notify the applicant and the designated Offices accordingly; it shall, immediately after receipt, communicate any amendment received subsequently to the designated Offices and notify the applicant accordingly. Where, under Article 17(2)(a), the International Searching Authority has made a declaration that no international search report will be established, the communication shall be effected, unless the international application is withdrawn, within 1 month from the date on which the International Bureau has been notified of the said declaration by the International Searching Authority; such communication shall be accompanied by an indication of the date of the notification sent to the applicant under Article 17(2)(a).

(c) [No change]

(d) [No change]

(e) [No change]

47.2 *Copies*

(a) [No change]

(b) [No change]

(c) Except to the extent that any designated Office notifies the International Bureau otherwise, copies of the pamphlet under Rule 48 may be used for the purposes of the communication of the international application under Article 20.

RULE 57

The Handling Fee

57.1 *Requirement to Pay*

(a) Each demand for international preliminary examination shall be subject to the payment of a fee for the benefit of the International Bureau ("handling fee") to be collected by the International Preliminary Examining Authority to which the demand is submitted.

(b) Where, because of a later election or elections, the international preliminary examination report must, in application or Article 36(2), be translated by the International Bureau into one or more additional languages, a "supplement to the handling fee" shall be collected by the International Bureau.

57.2 *Amounts of the Handling Fee and the Supplement to the Handling Fee*

(a) The amount of the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case

shall be the amount as so set out, increased by as many times the same amount as the number of languages into which the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau.

(b) The amount of the supplement to the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case shall be the amount as so set out, multiplied by the number of additional languages referred to in Rule 57.1(b).

(c) The amount of the handling fee shall be established, for each International Preliminary Examining Authority which, under Rule 57.3(c), prescribes the payment of the handling fee in a currency or currencies other than Swiss currency, by the Director General after consultation with that Authority and in the currency or currencies prescribed by that Authority ("prescribed currency"). The amount in each prescribed currency shall be the equivalent, in round figures, of the amount of the handling fee in Swiss currency set out in the Schedule of Fees. The amounts in the prescribed currencies shall be published in the Gazette.

(d) Where the amount of the handling fee set out in the Schedule of Fees is changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amount set out in the amended Schedule of Fees.

(e) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish the new amount in the prescribed currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that the interested International Preliminary Examining Authority and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Authority from that date.

57.3 *Time and Mode of Payment*

(a) The handling fee shall be due at the time the demand is submitted.

(b) Any supplement to the handling fee shall be due at the time the later election is submitted.

(c) The handling fee shall be payable in the currency or currencies prescribed by the International Preliminary Examining Authority to which the demand is submitted, it being understood that, when transferred by that Authority to the International Bureau, it shall be freely convertible into Swiss currency.

(d) Any supplement to the handling fee shall be payable in Swiss currency.

57.4 *Failure to Pay (Handling Fee)*

(a) Where the handling fee is not paid as required, the International Preliminary Examining Authority shall invite the applicant to pay the fee within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the demand shall be considered as if it had been received on the date on which the International Preliminary Examining Authority receives the fee, unless, under Rule 60.1(b), a later date is applicable.

(c) If the applicant does not comply wtih the invitation within the prescribed time limit, the demand shall be considered as if it had not been submitted.

57.5 *Failure to Pay (Supplement to the Handling Fee)*

(a) Where the supplement to the handling fee is not paid as required, the International Bureau shall invite the applicant to pay the supplement within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the later election shall be considered as if it had been received on the date on which the International Bureau receives the supplement, unless, under Rule 60.2(b), a later date is applicable.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the later election shall be considered as if it had not been submitted.

57.6 *Refund*

In no case shall the handling fee, or the supplement to the handling fee, be refunded.

RULE 96

The Schedule of Fees

96.1 *Schedule of Fees Annexed to Regulations*

The amounts of the fees referred to in Rules 15 and 57 shall be expressed in Swiss currency. They shall be specified in the Schedule of Fees which is annexed to these Regulations and forms an integral part thereof.

SCHEDULE OF FEES

Kind of Fee	*Amount*
1. *Basic Fee:* (Rule 15.2(a)) if the international application contains not more than 30 sheets	325 Swiss francs
if the international application contains more than 30 sheets	325 Swiss francs plus 6 Swiss francs for each sheet in excess of 30 sheets
2. *Designation Fee:* (Rule 15.2 (a))	78 Swiss francs
3. *Handling Fee:* (Rule 57.2(b))	100 Swiss francs
4. *Supplement to the Handling Fee:* (Rule 57.2(a))	100 Swiss francs

TOPIC 4: CHANGES IN THE ADMINISTRATIVE INSTRUCTIONS

The following modifications in the Administrative Instructions have been promulgated by the Director General of the World Intellectual Property Organization in accordance with PCT Rule 89.2 with effect from November 9, 1978.

SECTION 107

Identification of International Authorities

[Only the modification is specified]

The example of Section 107(b), is modified to read "(e.g., "RO/JP," "ISA/US," "IPEA/SU")."

SECTION 201

Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appears in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request Form, the two-letter country code as appears in *Annex B* (for example, where France is the third designated State in Box V of the request form, "FR 3. France" or "FR 3. French Republic").

(b) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action. If the international application has already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify promptly that Bureau and that Authority. In any event, the International Bureau shall, where the receiving Office fails to do so, cancel *ex-officio* the designation of States other than Contracting States and inform the applicant, the receiving Office and the International Searching Authority promptly of such action.

SECTION 203bis

National and Regional Patents

Where the request of the international application contains a designation of a Contracting State without an indication of the wish to obtain a regional patent and also a designation of the same Contracting State with an indication of the wish to obtain a regional patent and the national law of the Contracting State does not contain a provision

referred to in Article 45(2), the receiving Office shall calculate the designation fees on the basis that a separate fee is payable in respect of the designation of the Contracting State in addition to the designation fee payable in respect of that Contracting State as a Contracting State or as one of a group of Contracting States for which a regional patent is sought.

SECTION 317

Procedure in the Case of the Designation of a State being Considered Not To Have Been Made

Where the receiving Office finds that, under Rule 18.4(b), the designation of a State is to be considered as not having been made, it shall indicate that fact in the international application by enclosing the designation of that State within square brackets and entering the words "CONSIDERED NOT TO HAVE BEEN MADE," or their equivalent in the language of the international application, in the margin, and shall promptly notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify promptly that Bureau and that Authority.

SECTION 412

Fee for Copies of Certain Documents

(a) The International Bureau shall make a charge of 6 Swiss francs to designated and elected Offices for a copy of any document cited in the international search report requested under Rule 44.3(c) or any document cited in the international preliminary examination report requested under Rule 71.2(c).

(b) When mailing by air is requested the actual cost of such mailing shall be additionally charged.

SECTION 503

Method of Identifying Documents Cited in the International Search Report

[Only the modification is specified]

In the example given in Section 503(a), the number of the patent document is modified to read: "JP, B, 50–14535."

[984 O.G. 2]

---

(79) FILING OF PCT OR EPC FORMAT APPLICATIONS IN CANADA

The following notice, which appeared in the July 4, 1978 issue of the Canadian Patent Office Gazette has been forwarded to the Patent and Trademark Office and is being republished for the information of United States applicants and representatives who may wish to file in Canada. The Canadian notice reads as follows:

"Filing of PCT or EPC Applications in Canada

The Canadian Patent Office will accept all disclosures, claims and drawings prepared in the formats required under the Patent Cooperation Treaty (PCT) or the European Patent Convention (EPC) in respect of Canadian applications for patents.

In particular, the margins called for under the PCT or EPC, while not in conformity with the Canadian Rules, will be accepted for filing and considered sufficient to complete applications. Pages of specifications and drawings may be of a size A4 or 8 x 13 inches so long as the full set of papers in a single application are consistent. The spacing between typed lines may be either double or one and one-half spaces.

J. A. BROWN,
Director, Patents Branch"

July 17, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[973 O.G. 28]

(80) ANSWERS TO QUESTIONS FREQUENTLY ASKED ABOUT THE PATENT COOPERATION TREATY

The following questions have been frequently asked concerning the Patent Cooperation Treaty (PCT). These questions and brief answers thereto are being published in the hope that they will aid in understanding the PCT. As appropriate, additional questions and answers relating to the PCT will be published from time to time.

1. Who can file an international application in the United States Receiving Office?
Answer: An international application may be filed in the United States Receiving Office (Patent and Trademark Office) by any applicant who is a resident or national of the United States of America (PCT Rule 19.1 and 35 U.S.C. 361(a)). The applicant may be either the inventor or the successor in title of the inventor (owner or assignee) for the purpose of filing an international application. However, the laws of the various designated countries regarding the requirements for applicants must also be considered when filing an international application. When the United States is designated, the applicant for the purposes of the United States of America must be the inventor. At the present time the applicant for all other designated countries may be either the inventor or the owner.

2. How can different applicants for different designated countries be indicated on the Request form?
Answer: An explanation may be given by means of the following example. An international application is to be filed designating the United States, Sweden and Switzerland. The assignee is to be the applicant for Sweden and Switzerland as the invention has been assigned to him. For the purposes of the United States, however, the inventor must be the applicant. If in this example, "A" is the assignee and "B" is the inventor, "A" and "B" must both be indicated as applicants, under Box II of the Request form. The name and other identifying information of one applicant would be placed in Box II and a check mark placed in the small box following the phrase "Additional information is contained in supplemental box." The name and other identifying information of the second applicant would be placed in the Supplemental Box on Page 3 of the Request form and entitled "II. Applicant (continued)." "B" as the inventor would also be named in Box III of the Request. Box IX, on page 2 of the Request, is then used to identify different applicants for different designated countries. In Box IX, "A" would be indicated as the applicant for Sweden and Switzerland, and "B" would be indicated as the applicant for the "United States of America." It should be noted that both "A" and "B" must also sign the Request form or a power of attorney if the Request is signed by an attorney or agent.

3. Must at least one of the inventors, who are the applicants for the United States, be a resident or national of a PCT member country in order to have the United States Patent and Trademark Office accept the application at the national stage?
Answer: The answer is yes, however, this question involves two basic issues which must be addressed separately. One issue relates to the requirements for a valid designation of the United States of America. The other issue relates to the requirements of the U.S. national law in order for the U.S. Patent and Trademark Office to accept the international application for the national stage. As to the first issue, PCT Rules 18.3 and 18.4 require that *at least one* of the applicants for each designated State must be a resident or national of a member country of the PCT Union in order for the designation to be valid. As to the second issue, although the designation of the United States of America may be valid for PCT international procedure, the international application will not be accepted at the United States national stage unless the applicant is the inventor (PCT Article 27(3) and 35 U.S.C. 111 and 373). Therefore, at least one of the inventors must be a resident of a PCT member country in order for the international application to enter the national stage in the United States of America. It should be noted, however, that if the owner or assignee is a resident or national of a PCT member coun-

try, the owner can be the sole applicant and file an international application designating all current PCT member countries other than the United States of America. Any invalid designation of States for which at least one applicant is not a resident or national of a Contracting State will be deleted by the Receiving Office.

4. What must be done for an international application to enter the national stage at the United States Patent and Trademark Office?
Answer: An international application will enter the national stage at the United States Patent and Trademark Office generally at the expiration of 20 months from the priority date of the application or if no priority claim is made at 20 months from the actual international filing date. When a declaration of unsearchability under PCT Article 17(2)(a) has been issued by the International Searching Authority, however, the date of entry into the national stage is 2 months from the date of mailing of the declaration of unsearchability (PCT Article 22(2)). By the expiration of the relevant date, the applicable requirements under 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office to avoid abandonment of the application. Entry into the national stage may also occur earlier at the express request of the applicant under the provisions of 35 U.S.C. 371(f). In order that earlier entry into the national stage may take place the applicable requirements of 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office. Requirements such as the Search Report and any amendments to the claims if they are not available when the other requirements of 35 U.S.C. 371(c) are met must be submitted promptly after they are made available.

5. Who must sign an international application?
Answer: The Request form of an international application must be signed either by all the applicants (PCT Rule 4.15) or the attorney or agent of all the applicants. In the latter case, a power of attorney signed by all applicants is filed with the international application in the Receiving Office (PCT Rule 2.1).

6. Must a license for foreign filing be obtained in order to file an international application?
Answer: No, a license for foreign filing is not required to file an international application but may be required before the applicant or the U.S. Receiving Office can forward a copy of the international application to a foreign patent office, the International Bureau or other foreign authority (37 CFR 5.11). A foreign filing license to permit transmittal to a foreign office or international authority is not required if the international application does not disclose subject matter in addition to that disclosed in a prior U.S. national application filed more than six months prior to the filing of the international application (37 CFR 5.11(a)(2)). In all other instances, the applicant should request a license for foreign filing (transmittal) (37 CFR 5.12) and if appropriate, identify any additional subject matter in the international application which was not in the earlier U.S. national application (37 CFR 5.14(c)). This request and disclosure information may be supplied on the PCT international application transmittal letter form, PTO–1382, which was published in the October 3, 1978 issue of the OFFICIAL GAZETTE. If no petition or request for a foreign filing license is included in the international application, and it is clear that a license is required in order to timely transmit the Record Copy, it is current Office practice to construe the filing of such an international application to include a request for a foreign filing (transmittal) license. If the license can be granted it will be issued without further correspondence. If no license can be issued, or further information is required, the applicant will be contacted. The automatic request for a foreign filing license does not apply to the filing of foreign national or regional applications outside the PCT.

7. What effect will a secrecy order have if applied to an international application?
Answer: If a secrecy order is applied to an international application, the application will not be forwarded to the International Bureau as long as the secrecy order remains in effect. If the secrecy order remains in effect at the end of the 14th month after the priority date of the international application, the international application will be declared withdrawn (abandoned) because the Record Copy of the international application was not received in time by the International Bureau (37 CFR 5.3(d), PCT Article 12(3), and PCT Rule 22.3). If the United States of America has been designated, however, it is possible to save the U.S. filing date, by fulfilling the requirements of 35 U.S.C. 371(c) prior to the end of the 14th month.

8. Can designations of additional countries be added after an international application is filed?
Answer: No, it is not possible to add designations to an international application after it is filed. Only those countries for which PCT has come into effect may be designated. The Request form, as filed, must contain the names of all designated countries in which protection is desired (PCT Rule 4.9). However, since the designation fees are not required until one year after the priority date, or the actual international application filing date if no priority is claimed (PCT Article 4(1)(ii) and PCT Rule 15.4(b)), applicants may initially designate all PCT countries in which they may have an interest and later only pay designation fees for those countries in which patent protection is seriously desired. Any designated country for which a designation fee is not timely paid is considered withdrawn (PCT Rule 15.5).

9. Can the PCT be used to obtain patent protection under the European Patent Convention (EPC)?
Answer: Yes, a PCT international application may contain the indication that regional patent protection under the EPC is desired for those States that are members of both PCT and EPC. As of October 1, 1978, six European States are members of both the PCT and EPC; they are: France, Federal Republic of Germany, United Kingdom, Sweden, Switzerland and Luxembourg. In order to indicate that EPC protection is desired for these States, the words "Regional Patent" must be placed after the name of the designated States in Box V on the first page of the Request form, e.g., "United Kingdom, Regional Patent," (PCT Administrative Instructions, Section 203). The Netherlands and Belgium, although members of the EPC, cannot be designated in a PCT international application since they have not ratified the PCT.

10. Can the national office of France be designated under the PCT as the office which would grant patent protection?
Answer: No, French national law states that only EPC regional patent protection is available for France if PCT is used. The Receiving Office will treat the designation of France as the wish to obtain EPC regional patent protection for France, even if the indication "Regional Patent" is missing (PCT Administrative Instructions, Section 203). However, if the European Patent Office is not yet examining the subject matter to which the invention relates, the applicant will be permitted to convert the European application to a French national application.

11. Can United States applicants use Chapter II of the PCT which provides for an international preliminary examination report being issued with an opinion on the (1) novelty, (2) inventive step, and (3) industrial applicability, of each claim in the international application?
Answer: No, an applicant filing in the United States Receiving Office cannot use PCT Chapter II since the United States of America did not ratify Chapter II (PCT Article 31(2)(a)).

12. When will the prior art effect of an international application begin in the United States?
Answer: The prior art effect under 35 U.S.C. 102(e) begins on the date the applicant has fulfilled the requirements of 35 U.S.C. 371(c)(1), (2) and (4). These requirements are that the national filing fee, a copy of the international application and a verified English translation thereof, if it was filed in another language, and an oath or declaration be filed in the Patent and Trademark Office. The international application also becomes prior art upon publication, which occurs either promptly after the expiration of 18 months from the priority date, or earlier at applicant's request.

13. When must a "prior art statement" be filed under the PCT?

Answer: If the United States of America is designated, a prior art statement under 37 CFR 1.97 and 1.98 should be filed at the time of entering the national stage (37 U.S.C. 371(b) or (f) or within three months thereafter. For purposes of 37 CFR 1.97(a) the date of entry into the national stage is considered to be "the time of filing the application."

14. Who may be contacted within the United States Patent and Trademark Office to answer additional questions on PCT?

Answer: Contacts within the United States Patent and Trademark Office include Mr. Louis O. Maassel, Crystal Plaza 3, Room 11D07, (703)557-3070; Ms. Mary E. Turowski, Crystal Plaza 2, Room 9C26, (703)557-3776; and PCT Receiving Office and Information Center, Crystal Plaza 2, Room 4C08, (703)557-2003.

DONALD W. BANNER,

Oct. 17, 1978. *Commissioner of Patents and Trademarks*

[976 O.G. 118]

(80.1) PATENT AND TRADEMARK OFFICE STUDY OF COURT DETERMINATIONS OF PATENT VALIDITY/INVALIDITY, 1973–1977

The Patent and Trademark Office has prepared a summary of the past five years (1973–1977, inclusive) of patent litigation in the Courts of Appeals (CA), District Courts (DCt), and Court of Claims (CtCl), including:

(1) The number and identification of cases and patents litigated; and

(2) the holdings and rate of patent validity, invalidity and infringement.

The information was extracted from the compiled notices filed in the Patent and Trademark Office by clerks of courts under the provisions of 35 U.S.C. 290, and from the reported decisions appearing in the *United States Patent Quarterly, Federal Second and Federal Supplement.*

The results of the study and of the similar study conducted for the period 1968–1972 are set forth in the accompanying table.

Court Determinations of Validity/Invalidity
1968–1972 and 1973–1977

	1968-1972				1973-1977			
	Patents Held		Percent Invalid	Infringed	Patents Held		Percent Invalid	Infringed
	Valid	Invalid			Valid	Invalid		
Court of Appeals:								
Utility	78	173	69	64	53	137	72	51
Design	0	8	100	0	2	4	67	2
Reissue	3	9	75	3	6	13	68	6
Plant	0	0	0	0	7	0	0	7
Total	81	190	70	67	68	154	69	66
District Court:								
Utility	247	135	35	503	187	170	48	321
Design	17	0	35	45	7	15	68	34
Reissue	6	14	70	6	7	4	36	16
Plant	0	0	0	1	1	0	0	1
Total	270	158	37	555	202	189	48	372
Court of Claims:								
Utility	17	8	32	17	16	12	43	11
Design	0	0	0	0	0	0	0	0
Reissue	0	1	100	0	1	1	50	0
Plant	0	0	0	0	0	0	0	0
Total	17	9	35	17	17	13	43	11
Grand Total	368	357	49	639	287	356	55	449

*This table compares data for 1973–1977 with data for 1968–1972 which were previously published in 144 Patent, Trademark & Copyright Journal at F–1 (Sept. 13, 1973). The methodology of the two studies is the same—the validity or invalidity of a given patent has been determined by tabulating the holding of the highest court in which the litigation was conducted and such holdings were made in each five year period. Where two or more courts concurred in holding the same patent valid or invalid, that patent was counted as valid or invalid only once in each five year period. Consequently, no attempt should be made to add tabulated data for 1973–1977 to similar tabulated data for 1968–1972 to obtain overall tabulated data for 1968–1977. Inasmuch as some holdings of validity or invalidity at the District Court level in 1968–1972 were duplicated (either affirmed or reversed) at the Court of Appeals level in 1973–1977, such an attempt to add tabulated data would result in some patents being counted twice in the 10 year period.

Explanatory Remarks

In the interest of clarity and elimination of any misconception as to the meaning and interpretation of the data tabulated above, the following explanation is offered.

Number of Patents: The number of individual patents litigated during the 1973–1977 five year period, in which the suit was terminated by dismissal, consent judgment, summary judgment, or holdings of validity, invalidity, injunction, etc., was approximately 2,017 (2,025 in 1968–1972). Of those, the number of patents in which there was judgment of validity, invalidity or infringement totalled 876[1] (989 in 1968–1972)

For reference purposes, it is noted that during this five year period, the Patent and Trademark Office issued approximately 382,000 patents. The percentage of patents litigated (2,017) with respect to the total number of patents issued over this five year period is 0.53%. Further, the number of patents issued by the Patent and Trademark Office covering the time span from the earliest reported litigated patent included in this study (#2,129,332) to the latest reported litigated patent included in the study (#3,995,102) is approximately 1,865,000. The percentage of patents litigated (2,017) with respect to this number is 0.011%.

Patents Held Valid or Invalid: Methods of calculation of validity data vary. For instance, the data may be (a) inclusive of each individual court holding of validity or invalidity, (b) limited to holdings within each of the judicial circuits, (c) restricted to a single holding representing the final adjudication of the patent's validity, or (d) directed only to the decisions of the appellate courts.

In this study, the validity or invalidity of a given patent has been determined by tabulating the result of decision of the highest court in which the litigation was conducted and such holdings were made. Where two or more courts concurred in holding the same patent valid or invalid, that patent was counted as valid or invalid only once. In the

[1] Excluded from that number are: (1) awards of priority for or against patentees in interference proceedings; (2) nine patents in which invalidity was predicated on collateral estoppel (*Blonder-Tongue Laboratories, Inc. v. Univ. of Illinois Foundation*, 402 U.S. 313 (1971)) resulting from an adjudication of invalidity occurring prior to January 1, 1973; (3) reported holdings of validity (three) or invalidity (one) rendered by state courts; and (4) holdings of validity (four) by the International Trade Commission.

rare instances where conflicting decisions on validity by coordinate tribunals have occurred, the patent was counted as invalid. It was noted that many court opinions and § 290 notices did not print out whether all, or only some, of the claims of a patent were held valid or invalid. Where it was observed that the court held only some claims of a given patent invalid and made no explicit findings of validity with respect to the remaining claims, the patent was counted as invalid, notwithstanding the presumption of validity accorded the remaining claims by 35 U.S.C. 282 and with full recognition that the resultant statistics would be biased unfavorably toward invalidity as a result. Where a court did explicitly hold some claims valid and other claims invalid, the patent was counted as valid, inasmuch as the patent remains in force with valid claims therein. A consent judgment of validity or invalidity, where denominated as such in the § 290 notice, was counted as a holding of validity or invalidity.[2] However, infringement and injunction holdings, without any mention of validity, were *not* presumed or counted as holdings of validity.

Rate of Patent Invalidity: The term "rate of patent invalidity" appears to have no recognized definite meaning. Such rate may be calculated as a percentage of total patents litigated or only as a percentage of those litigated patents having a holding of validity or invalidity. The latter base has been employed in this study.

It is to be stressed that there is no evident link between the characteristics of the litigated patents which caused them to be litigated and the characteristics of the remaining unlitigated patents which would justify the conclusion that the rate of invalidity noted above can be extrapolated to, or is in any way representative of, the total patent universe.

Infringement: Instances of infringement are not always indicated in the report of the courts' decisions. Often there is no explicit holding that a claim is infringed, although such conclusion would be implicit because the court enjoined the defendant from making, using or selling certain devices. Accordingly, in the absence of any countervailing information, an injunction has been counted as a holding of infringement for statistical purposes. The number of individual patents held to be infringed totalled approximately 449, compared to 540 in the period of 1968–1972.[3]

Discussion

The Patent and Trademark Office views this study as far more comprehensive and accurate than studies heretofore undertaken which have examined merely, for the most part, reported decisions of the Courts of Appeals. Those previous studies are included as a bibliography to this study.

It is to be noted that the percentage of litigated patents held invalid by the Courts of Appeals (69%) in the five year period 1973–1977 covered by this study corresponds closely to the invalidity percentages found by the other authors and studies mentioned in the bibliography for the period 1940–1972, including the 70% rate found by the previous PTO study for the period 1968–1972. However, the inclusion in this study of unappealed and unreported judgments of the District Courts to obtain a resultant total rate of patent invalidity of approximately 55% places the entire litigated patent validity/invalidity picture in better perspective.

Nevertheless, certain inadequacies in the information available from the 35 U.S.C. 290 notices could result in potentially erroneous statistics even in this study. In that connection, it was found that the notices submitted under 35 U.S.C. 290 had the following defects:

(1) Notices of decisions rendered were not filed in *every* case;[4]

(2) When filed, the notices were not necessarily submitted promptly; and

(3) The data in the notices were incomplete, and, in many instances, incorrect. For example, mere notations of dismissal, which were often indiscriminately employed in the § 290 notices, were found to stand for holdings of validity or invalidity upon comparison with any reported decisions corresponding to those § 290 notices.

A particularly serious problem appears to have developed with respect to 35 U.S.C. 290 notices filed by clerks of the U.S. Circuit Courts of Appeals. Few notices of decision rendered in the Circuit Courts have been received by the Patent and Trademark Office and published in the Official Gazette in the period 1973–1977. Only the 6th Circuit Court of Appeals and, to a lesser degree, the 1st Circuit Court of Appeals, have more or less consistently filed such notices with the Office. That factor, coupled with an increasing tendency by the Federal Courts in general since 1973 to decide litigation accompanied by an unpublished opinion,[5] gives reason for concern with respect to the completeness and accuracy of the data tabulations which have been gathered largely from reported decisions of the Courts of Appeals.

Additionally, it may be noted that a summary limited to a "five year" period involves certain factors that give an incorrect impression. Thus, aside from the obvious effects of subsequent appeals, a dismissal in one suit (within the five year period) subsequent to, or prior to, a final adjudication of the same patent's validity, or invalidity, in another suit (outside the five year period) has significance different from that of a dismissal in the absence of any other decision. In other words, the complete history of the patent is necessary to a proper appreciation of the patent's validity or invalidity.

Bibliography

(1) Baum, "The Federal Courts and Patent Validity: An Analysis of the Record," 56 JPOS 758 (December 1974).

(2) Bjorge and Behn, "Patent Validity/Invalidity Study," Policy Planning Staff Project 73–2, Patent and Trademark Office, U.S. Dept. of Commerce, April 3, 1974.

(3) Chognard, "Patent Litigation and Validity," 41 JPOS 291 (1959).

(4) Dearborn et al., *Encylopedia of Patent Practice and Invention Management* (Calvert), page 22, et seq. examined 734 adjudicated patents in the circuit courts from 1953–63.

(5) Federico, "Adjudicated Patents 1948–54," 38 JPOS 233, 244, reported on adjudications from 1925–54.

(6) Gausewitz, "Brief in Support of Proposed Amendment to Section 103, Title 35, Patents, U.S. Code," 51 JPOS 290 (May 1969).

(7) Horn et al., "The Federal Courts' View of Patents—A Different View," 55 JPOS 134 (March 1973) studied 597 adjudicated patents from January 1961 through December 1970.

(8) Koenig, dissertation submitted in partial fulfillment of requirements for S. J. D. degree, New York University Law School, December 1971. She studied adjudications of 854 patents from 1953–67.

(9) Koenig, *Patent Invalidity: A Statistical and Substantive Analysis, C.* Boardman Co., Ltd.: New York, 1974).

(10) Moxon, "Patent Invalidity Study," unpublished, January 17, 1973, examined 284 adjudicated patents in the period 1967–71.

(11) Senate Report No. 167, 90th Congress, 1st Session examined validity of 46 patents before *Graham* v. *John Deere*, 383 U.S. 1 (1966) and 38 patents subsequent to *Graham*.

(12) Tegtmeyer, "For Greater Patent Validity," American University Law Review, Vol. 19, No. 1 (December 1969) studied 869 adjudicated patents from 1953–68.

[2] The number of consent judgments of validity totalled approximately 50, and there was one consent judgment of invalidity.

[3] For the period 1968–1972, the infringement tabulations appearing in the table correspond to holdings of infringement, i.e., many patents were held—and counted—as infringed more than once. In contrast, for the period 1973–1977, a given individual patent held infringed more than once was counted as infringed only once.

[4] On many occasions, the existence and result of District Court litigation conducted in 1973–1977 was discovered only on reading a later-reported appellate court decision and opinion.

[5] For example, the published decision and opinion of the District Court in *Azoplate Corp.* v. *Silverlith, Inc.*, 367 F. Supp. 711, 180 USPQ 616 (D.Del. 1973) (concerning which the Office received notice under § 290) was affirmed, 506 F. 2d 1050, 184 USPQ 577 (3rd Cir. 1974) without published opinion and without apparent notice to the Office of the Circuit Court's decision. For purposes of this study, no attempt was made to "Shepardize" reported or unreported District Court decisions involving nearly 400 patents to determine whether a Circuit Court decision in the same case appears in a table of unpublished decisions and opinions.

(13) U.S. Patent Office, *Further Studies on Patent Validity/Invalidity on a Circuit-by-Circuit Basis*, 1968–1972, 165 Patent, Trademark & Copyright J. at D–1 (Feb. 14, 1974).

(14) U.S. Patent Office, *Patent Office Study of Court Determinations of Validity/Invalidity*, 1968–1972, 144 Patent, Trademark & Copyright J. at F–1 (Sept. 13, 1973).

See also Howard T. Markey, "The Status of the U.S. Patent System-Sans Myth, Sans Fiction," 59 JPOS 164 (March 1977), who summarizes the results found by some of the above authors or studies, and includes additional bibliography.

Additional Information

For additional information concerning the Patent and Trademark Office's 1973–1977 study, contact Mr. Gerald H. Bjorge, 703–557–3534.

LUTRELLE F. PARKER,
Date: Nov. 1, 1979. *Acting Commissioner of Patents and Trademarks.*

[989 O.G. 2]

TRADEMARK NOTICES

(81) INTERVIEWS INVOLVING TRADEMARK APPLICATION

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner.*

This supersedes the notice of February 10, 1958, 728 O.G. (TM 1).

[804 O.G. TM 147 (July 28, 1964)]

(82) POWERS OF ATTORNEY IN REGISTERED TRADEMARK FILES

On and after February 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C. M. WENDT,
Jan. 30, 1967. *Director.*

[835 O.G. TM 95 (Feb. 21, 1967)]

(83) PREFACE TO THE TRADEMARK O.G. NOTICES

In September 1970, a Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce. The Purpose of this Committee was to advise the Patent Office on ways to increase the efficiency and effectiveness of the administration of the Trademark Act. A report of this Advisory Committee has been received by the Commissioner of Patents. After reviewing the recommendations, although the review is not complete, it has been decided to make certain changes in trademark practice and procedure, and to propose changes in the rules of practice. Beginning with this issue of the OFFICIAL GAZETTE and in subsequent issues as needed, announcements will be published concerning changes in procedures and proposed amendments to the Trademark Rules of Practice.

• • • • •

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(84) REQUEST FOR EXTENSION OF TIME IN WHICH TO OPPOSE

The Patent Office is adopting a new procedure to be used when filing a request for an extension of time in which to oppose under Section 13 of the Trademark Act and Rule 2.102, Trademark Rules of Practice. All requests for extension of time should be submitted in triplicate. The Patent Office will stamp each copy of the request with the action taken and send a copy to the requester and the applicant. The third copy will be entered in the file.

The purpose of this new procedure is to expedite the handling of extensions of time by eliminating the preparation of a formal notice of the disposition of the request. Further, this procedure will provide the applicant with additional information concerning the potential opposition.

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 3 (Aug. 3, 1971)]

(85) INITIAL PROCESSING OF APPLICATION

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application pa-

pers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 FR 948; Jan. 21, 1972

[895 O.G. TM 193 (Feb. 22, 1972)]

---

(86) PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

[897 O.G. TM 2 (Apr. 4, 1972)]

---

(87) TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on Industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was composed of officials from the Department of State, the U.S. Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973; in the OFFICIAL GAZETTE of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

[912 O.G. TM 205 (July 24, 1973)]

---

(88) REALIGNMENT OF PATENT OFFICE HANDLING OF OPPOSITION PAPERS

In order to increase efficiency in processing papers, all activities connected with the handling of oppositions have been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board. As a result of the transfer, requests for extension of time to oppose and matters pertinent thereto are now received and processed by the staff of the Trademark Trial and Appeal Board rather than by the staff of the Office of the Director of the Trademark Examining Operation.

No substantial change in procedure in the handling of papers relative to oppositions and extensions of time is contemplated by this realignment of duties in the Patent Office. Reasonable requests for extensions of time to oppose will continue to be granted with liberality particularly if there is no protest by another party and if the parties are negotiating or otherwise exploring bases for settlement, and fees for both verified and unverified oppositions will continue to be required to be filed within the time prescribed for opposing.

RENE D. TEGTMEYER,
Nov. 14, 1974. *Assistant Commissioner for Trademarks.*

[929 O.G. TM 62 (Dec. 10, 1974)]

(89) CONFERENCE OF PARTIES IN TRADEMARK INTER PARTES PROCEEDINGS

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

[932 O.G. TM 2 (Mar. 4, 1975)]

(90) INTERNATIONAL PROTECTION OF GOVERNMENT EMBLEMS AND SEALS

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114 (Sept. 21, 1976)]

(91) TRADEMARK RULES OF PRACTICE

The ninth edition of the Trademark Rules of Practice, dated December 1976, is now available. It replaces the previous edition in its entirety.

The Rules are in looseleaf form so as to accommodate revisions. New subscriptions may be ordered from:

Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402.

The charge is $5.00 for domestic mailing and $6.25 for foreign mailing. Prior subscribers were sent a notice of expiration by the Government Printing Office in January, 1977.

The Rules booklet is available only by subscription. When revisions are issued, they are a part of the subscription and are mailed automatically. Revisions are announced in the OFFICIAL GAZETTE of the Patent and Trademark Office.

BERNARD A. MEANY,
Sept. 16, 1977. *Assistant Commissioner for Trademarks.*

[963 TMOG 12 (Oct. 18, 1977)]

(92) RECORDING OF "TERRITORIAL ASSIGNMENTS" IN THE ASSIGNMENT DIVISION OF THE PATENT AND TRADEMARK OFFICE

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

BERNARD A. MEANY,
Oct. 7, 1977. *Assistant Commissioner for Trademarks.*

[964 TMOG 8 (Nov. 8, 1977)]

(93) TRADEMARK RULE 2.165 REQUIREMENT WHERE A SECTION 8 AFFIDAVIT OF DECLARATION IS HELD INSUFFICIENT

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least repond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (*b*) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner

has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

BERNARD A. MEANY,
Dec. 12, 1977. *Assistant Commissioner for Trademarks.*

[966 TMOG 80 (Jan. 10, 1978)]

(94) DISSEMINATION OF TRADEMARK INFORMATION

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703–557–3268.

Feb. 15, 1978. BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[968 TMOG 9 (Mar. 14, 1978)]

---

(95) NOTICE TO PURCHASERS OF TRADEMARK INDICES

An incorrect stock number has been assigned to the "1976 Index of Trademarks."

The correct stock number to be used when ordering the "1976 Index of Trademarks" through the Superintendent of Documents is as follows: 003–004–00532–7. The cost of this publication is $8.00 per copy.

RICHARD J. SHAKMAN,
Mar. 14, 1978. *Assistant Commissioner for Administration.*

[969 TMOG 2 (Apr. 4, 1978)]

TRADEMARK REGISTRATION TREATY

Implementing Legislation

On September 3, 1975 the Trademark Registration Treaty (TRT), signed at Vienna, Austria, on June 12, 1973, was transmitted by the President to the Senate of the United States with a view to receiving its advice and consent to ratification. Legislation designed to implement the TRT has been prepared by the Patent and Trademark Office in the Department of Commerce.

Following a suggestion by the General Accounting Office, the Patent and Trademark Office is planning a survey of a random sample of United States trademark owners who would have a direct interest in the TRT and in the changes required in United States trademark law. In order to provide the interested public with the information on which the sampled companies will base their responses, the complete draft legislation, including Summary, Statement of Purpose and Need and Sectional Analysis is reproduced below. A copy of the survey questionnaire will be published in a future issue of the OFFICIAL GAZETTE.

The text of the TRT was reproduced in the OFFICIAL GAZETTE *of July 24, 1973. Some post conference documents, including a history of the Treaty, were reproduced in the* OFFICIAL GAZETTE *of February 11, 1974. The report of the United States delegation to the Vienna Conference was reproduced in the* OFFICIAL GAZETTE *of February 11, 1975. Additional copies of the material reproduced below as well as the previous* OFFICIAL GAZETTE *publications are available upon request to the Commissioner of Patents and Trademarks.*

DONALD W. BANNER,
Commissioner of Patents and Trademarks.
Date: July 11, 1978.

SUMMARY

In 1973, the United States and thirteen other countries signed the Trademark Registration Treaty. This Treaty was transmitted to the Senate on September 3, 1975, with a view to advice and consent to receiving its ratification.

The Trademark Registration Treaty will establish an international trademark filing arrangement, through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Since the Treaty is not self-executing, the instrument of United States ratification will not be deposited until the necessary implementing legislation is enacted.

The proposed implementing legislation effects the necessary changes in the trademark statutes and provides to persons filing domestic applications the same benefits in the United States as those accorded under the Treaty. The implementing legislation would not come into force until the Treaty enters into force. Entry into force requires the deposit of instruments of ratification or accession by five States.

STATEMENT OF PURPOSE AND NEED

The enclosed bill would amend the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) to implement the Trademark Registration Treaty and make certain of its benefits available to persons filing national applications for United States trademark registration.

First, the bill would implement the Trademark Registration Treaty (TRT), an agreement adopted on June 12, 1973, by the Vienna Diplomatic Conference on Industrial Property to facilitate the protection of trademarks used or intended to be used in international commerce. This Treaty was signed by the United States and was transmitted by the President to the Senate of the United States on September 3, 1975, with a view to receiving its advice and consent to ratification.

Ratification of the Treaty and its implementation by this bill would enable United States nationals and residents to avail themselves of the advantages offered by the Treaty when it has entered into force with respect to the United States. In addition to the procedural implementing provisions, the bill would effect certain changes in the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) that are required to be made in order to comply with certain conditions and requirements of the Trademark Registration Treaty. These changes would not come into effect until the entry into force of the Treaty.

Second, the bill also makes modifications in the present law to provide to United States nationals and residents the same benefits when filing national applications for trademark registration in the United States Patent and Trademark Office as would be available to such applicants in the United States if filing under the Treaty.

Purpose of Trademark Registration Treaty

The Trademark Registration Treaty has as its primary purpose the establishment of a trademark filing arrangement through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Separate actions in approximately 150 jurisdictions (i.e. States, possessions, territories, etc.) are now required by United States companies in order to extend the protection of a trademark throughout the world. The complexity and high cost of establishing and protecting trademarks in international markets through the diverse national laws and procedures is a serious problem for businessmen seeking to further their commercial objectives by the sale of trademarked products across national boundaries. However, if trademark protection in potential foreign markets is not secured promptly, the unprotected mark is frequently appropriated by a "pirate" or may even be coincidentally adopted by another.

The entry into force of the Trademark Registration Treaty would help alleviate these problems by establishing an alternative international registration procedure through which the effects of national trademark registration in member countries could be secured, maintained and renewed on a central international register of marks. With a few exceptions, the effects of international registration in each participating State would remain subject to the substantive requirements of the national laws of such State.

History of Treaty Development

The Trademark Registration Treaty is the culmination of continuous efforts, since 1965, by the United States, to participate in an acceptable international arrangement to facilitate the protection of trademarks in international commerce. Consideration was first given to the possibility of United States adherence to the Madrid Agreement for the International Registration of Marks, a special arrangement under the Paris Convention for the Protection of Industrial Property. The Madrid Agreement, in force since 1891, has long operated successfully among twenty-three countries, principally European.

By 1968, it became apparent that there was substantial U.S. private sector opposition to adherence to the Madrid Agreement in its present form, largely because of certain of its features which, it was argued, would be contrary to the interests of United States firms.

From 1968 to 1970, there were efforts to revise the Madrid Agreement to correct these alleged deficiencies, but these efforts were not successful. However, whereas there was opposition to our adherence to the Madrid Agreement, interested private groups continued to urge United States participation in an acceptable trademark registration treaty.

In September, 1970, a United States sponsored resolution to develop a new trademark registration treaty was adopted unanimously by the competent administrative organs of the Paris Convention. After several drafts and examination by three Committees of Experts and several Consultants' groups, a final draft was considered at a diplomatic conference held in Vienna, Austria, from May 17 to June 12, 1973. Fifty States and thirty-one international organizations (governmental and non-governmental) were represented at the conference. On June 12, 1973, the Trademark Registration Treaty was signed by eight countries, including the United States, and remained open for signature until December 31, 1973, by which date a total of fourteen countries had become signatories. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession. To date, none of the signatory States has ratified the Treaty. Four States (Congo, Gabon, Togo, and Upper Volta) have deposited instruments of accession.

Main Features of Treaty

The Trademark Registration Treaty will establish a multilateral trademark filing arrangement for residents or nationals of its member countries, which provides easier procedures for securing, administering and maintaining national trademark registration effects in other countries by filing a single international application, securing a single international registration and maintaining a record of such rights on a central international register. International registration amounts to central recording of a "bundle of national rights" rather than a separate property right.

With some exceptions (as noted below), the substantive aspects of rights are regulated by each member State according to its national law. The main features of the Treaty are as follows:

1. A national or resident of a member State may file directly with the International Bureau of the World Intellectual Property Organization an international application designating the States in which protection of the trademark is desired. Any number of States, including the applicant's home State, may be designated.

2. The international application may claim the priority (Paris Convention "right of priority") of an earlier first application to register the same trademark.

3. The application is subject to an international fee plus a fee for each designated State (not higher than 100% of the total fees for national registration).

4. After a brief examination as to formal requirements, the trademark is registered by the International Bureau. The details of the international registration are promptly published in English and French in an international gazette and communicated to each of the designated States.

5. Unless refused by a designated State, the international registration is accorded the same legal effect as if the same trademark were registered nationally in that State. The time limit for the initial notice of refusal, including all reasons or possible reasons for refusal, is fifteen months from the date of the international publication. The reasons for refusal cannot be different from those applicable to national applications.

6. If initially refused by any designated State, the owner is notified of the refusal and is guaranteed the same procedural rights of re-examination and/or remedies available in the case of refusals of national trademark applications. Further proceedings are not subject to any Treaty time limits, and are carried out directly between the owner and the concerned national office.

7. The effects of an international registration may be cancelled in any designated State according to the national law of that State. The effect of cancellation is limited to the State in which the legal action for cancellation was brought.

8. An international registration may be renewed at ten year intervals by a single renewal application filed with the International Bureau.

9. States not originally designated may be added later by requesting the recording of later designations of the new States.

10. Assignments, changes of name, limitations of the goods and/or services, etc. may be recorded by filing a single international request, with the same legal effect as if recorded in the national registers.

11. Non-use of the trademark during an initial period of three years counted from the filing date cannot result in refusal or cancellation by any State. However, any State may require that the owner declare his intention to use the trademark in that State and may further provide in its law that no action for infringement may be commenced until the continuing use of the trademark in that State has started and that any remedy (e.g. damages or profits) may relate only to the period after use has commenced.

The benefits of the Treaty will be available only to nationals or residents of member countries. As to such persons, the Treaty may be used to secure protection in a few countries, or in many, depending upon the extent of the commercial interests.

The Treaty provides that the contracting States shall constitute a Union for the international registration of marks. The provisions for administration of the Union are similar to those established for the Patent Cooperation Treaty, which was transmitted to the Senate on September 12, 1972, and was favorably acted on by that body on October 30, 1973.

The Regulations annexed to the Treaty provide rules concerning administrative requirements and procedures and details useful in implementation of the Articles.

Interest of Other Countries

In addition to the United States, the signatories of the TRT include a number of major trading countries (e.g.

Federal Republic of Germany, United Kingdom, Italy, Sweden, Austria). Others are awaiting developments in the United States, which furnished primary impetus to the negotiations. In particular, the interest of most Western European countries is contingent upon United States ratification, primarily because of the existence of the Madrid Agreement. The Trademark Registration Treaty is more modern than the Madrid Agreement, has more advantages for trademark owners and eliminates features which have long inhibited the territorial growth of the Madrid system. However, the position of the Madrid Agreement members is dependent upon the interest of major countries outside that Union in the new arrangement. Of these, the United States is clearly the most important. However, Japan, United Kingdom, Canada, and the Scandinavian group are among other countries outside the Madrid Union which are known to be seriously considering participating in the TRT arrangement, or, failing that, in some other multilateral agreement, such as Madrid.

Main Advantages

The main advantages of the Treaty are the simplified procedures provided in order to secure national registration effects, to maintain the rights thereby acquired, and to continue these rights by renewal. Other benefits are the time limits for national refusal notifications and the limitations on national use requirements.

The Treaty will not be a panacea for all trademark problems. It will establish what is essentially a multilateral trademark filing arrangement, reserving (except for a few points) the substantive aspects of rights to regulation on a country-by-country basis under the national law of each country. However, by limiting participation to States having previously adhered to the Paris Convention for the Protection of Industrial Property, it assimilates or applies the norms and standards of trademark protection law which have been agreed to by the eighty-seven member countries of that Union over the almost 100 years of its existence. The fact that its filing, maintenance and administrative procedures are independent of national procedures means that a framework for future development of international substantive standards and further rationalization of procedures is provided. Also, since trademark piracy is best dealt with preemptively by prompt filing and diligent maintenance practices, the Treaty attacks this problem directly by facilitating the filing and maintenance procedures.

Even the short range objectives and benefits will not be immediately realized upon United States ratification. Five States must ratify before the Treaty enters into force. To date, only eighteen out of the eighty-seven potential member States have taken positive steps (i.e. fourteen signatories and four adherents). The benefits of simplified filing and maintenance will accrue in proportion to the number of member States.

Effect on U.S. System—Cost

As the Treaty matures in terms of the number of participating States, one of its effects will probably be an increase of foreign origin filings in this country (present foreign origin filings are less than 10% of total filings). It is fundamental that the benefits of simplification accrue in both directions. To the extent that any increased filings reflect existing commercial rights, this result would be consistent with a fundamental purpose of the federal trademark registration system, i.e. the central recording of marks in which rights may exist. Because registration is not mandatory in order to secure rights in a trademark in the United States (and this would not change under the Treaty), the U.S. system is designed to encourage federal registration, in order to provide centralized information to those searching for and selecting new marks for new products or services to be sold in commerce. Part of the increase, as explained later, may result from permitting the filing and registration of marks based on an intent to use as an alternative to actual use.

Since the intent to use amendments to be effected by the bill will not come into force until the date of entry into force of the Treaty, none of the financial consequences will accrue until after that date. It is assumed that entry into force will occur promptly after United States ratification, if not before that date. Assuming action by the 95th Congress, increased incremental costs and manpower requirements of the Patent and Trademark Office have been estimated as shown in the following chart.

ESTIMATED COSTS INCURRED BY RATIFICATION OF TRT AND ENACTMENT OF RELATED LEGISLATION [1]
[Dollar Amounts in Thousands]

	FY 1979		Adjustment for FY 1980		Total FY 1980		Adjustment for FY 1981		Total FY 1981	
	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar
Operational printing [2]		581.9		(+68.7)		650.6		(+54.8)		705.4
Operational, other [3]	21.7	420.3	(+11.6)	(+252.6)	33.3	672.9	(+7.4)	(+176.1)	40.7	849.0
Start-up [4]	3.0	109.8	(−2.0)	(−73.4)	1.0	36.4	(−1.0)	(−31.5)		[5] 4.9
	24.7	1,112.0			34.3	1,359.9			40.7	1,559.3

[1] These estimated costs will be partially offset by fees to the same extent as under our national system.
[2] Assumes additional publication of all applications will be required (see discussion of Sections 9 and 10 of bill in the Sectional Analysis).
[3] Includes supervisory, professional and clerical personnel, and mail.
[4] Includes Legislation and International staff, Organization and Systems, and all travel.
[5] Only travel remains.

An important caveat is that many of the assumptions on which the above estimates are based are, at this point, very speculative. Also, since the Treaty provides for the assessment of country designation fees (paid centrally) at a level equal to the fees for national registration, any increased operational costs of the Patent and Trademark Office due to increased filings will be offset to the same extent as under the national system. The above cost estimate does not reflect these partially offsetting fees.

Additional cost factors, too remote for attempting to estimate at this time, involve contributions to the World Intellectual Property Organization (WIPO) which will serve as the International Bureau under the Treaty. Article 34(5) of the Treaty establishes a working capital fund, constituted by a single payment made by each contracting State. Based on the experience in the case of other treaties administered by WIPO, it is believed that consideration of any working capital fund would be deferred, at least, until several years after the Treaty enters into force. The amount of the initial payment of each contracting State to this fund is computed with due regard to the number of international applications which are filed by residents of that State. Thus, a direct relationship exists between the amount of the payment by the United States and the use of the TRT by U.S. companies.

In starting up for operations under the TRT, the International Bureau will have to establish a budget financed from fees and charges for services rendered by the International Bureau, from sales of publications and other miscellaneous income. While the Madrid Agreement, also administered by WIPO, has operated at a profit for many years, and the TRT is designed to be self-supporting under normal circumstances (Article 34(4)), the possibility of deficits cannot be ruled out altogether. Deficits would be covered out of the working capital fund, which fund would then be reimbursed by the States. Deficits are not expected to be of any significant magnitude. Contributions to the working capital fund would be the responsibility of the Department of State.

Effect on U.S. Trademark Law

Participation in the international system will require that our national trademark law be amended in a number of respects. The most fundamental change is one which would permit the securing of a national registration in the United States based on intention to use the trademark applied for, and provide for an initial period of 3 years during which nonuse of the mark could not be a basis for refusing or cancelling such registration. Consistent with the Treaty, the proposed legislation provides that infringement actions in the courts would continue to be contingent upon the commencement of use, however.

As explained by the President in forwarding the Treaty to the Senate for its advice and consent, there is a sharp difference of opinion among interested persons, firms and associations in the United States as to the desirability of making this change, and, to a lesser extent, other less significant changes, required by the Treaty, in our national law.

The essence of the change in United States law is that it would move us from the strict use approach (today held to only by the United States, and a few other countries, e.g. Republic of Philippines, Panama) to the middle position, i.e. a use or intention to use system similar in principle to that of the British. The change is believed to be more consistent with the legitimate needs of businessmen, especially where international trade is contemplated.

Intention To Use Legislation

In fact, legislation permitting the filing of a trademark application based on an intent to use was widely supported in the private sector and, in the 91st Congress, identical House and Senate bills, substantially the same as the earlier Senate bills, were introduced at the request of the Administration (S. 3110, McClellan; H.R. 14050 Kastenmeier). This legislation was not reintroduced in the 93rd and 94th Congresses, however, since it was known at an early stage in the Treaty negotiations that the use requirements of the United States would be affected.

The support of intention to use legislation in the United States had its foundation in domestic concerns. Under present law actual use of a mark is a prerequisite to the filing of an application for registration. Thus, every applicant for federal registration, in addition to other requirements, must specify in his application the date of first use of the mark and the date of first use in commerce over which Congress has control (usually interstate commerce).

As applied to the adoption of new trademarks, the requirement of establishing use of a mark prior to applying for its registration is unrealistic since the time interval between clearance and adoption of a trademark and use of commercial quantities varies from several months to several years depending upon the products involved. Typically, before a consumer product is marketed commercially, there is considerable time and effort expended in the developmental effects. After having undertaken the effort and expense of creating and planning the promotion of a new mark, however, the businessman may find that the mark is not registrable because of conflict with another mark or some other reason. These problems led to the drafting and introduction of intent to use legislation.

Canada, in 1954, after careful study, adopted a system permitting applications for registration on the basis of an owner's proposed use. The Canadian system is favorably regarded by businessmen, as are the intention to use systems of many other nations. Approximately one-half of the trademark applications filed today in Canada are based on proposed use, rather than actual use, evidencing the usefulness and acceptability of the system.

Differences Between Previous Intention To Use Legislation and the Treaty

Although similar in terms of their substantive effect, the "intent to use" amendments previously proposed in this country do not satisfy the requirements of the Treaty. There are two basic differences:

(1) The time period under the Treaty during which use may not be required cannot be less than 3 years, counted from the filing date.

Under the "intent to use" bills, the time period was flexible, depending upon the length of time consumed by the examination, i.e. 90 days, counted from the date of allowance of the application by the examiner (a shorter period if the application were opposed). Although entirely dependent upon pendency experience of the Patent and Trademark Office, the period of permitted non-use of most of the applied for marks under those bills would have been in the approximate range of one to two years, counted from the filing date.

Whereas the Treaty permits the "reserving" of a mark for an initial 3 years, more extended "reserving" may be precluded under Article 19(3) and this is done in the proposed implementing legislation. Thus, the 3 year period cannot be extended except for extraordinary reasons. The fact that an application is still pending at the date of expiration of the 3 years may *not* be accepted as a reason for extension. The use requirements after 3 years are the same as under present law.

(2) Under the Treaty, the national *registration* effect of an international registration may not, for the initial three year period, be refused or cancelled on the ground of non-use. However, any country may provide that the right to sue for infringement of the registered mark (even during the three years) is subject to the condition of use, i.e. no right to sue until after continuous use has commenced; and that any remedy may relate only to the period after use has commenced.

Under the "intent to use" bills, an application could be filed, and priority secured, based on intent to use, without actual use, but the *registration* would not issue until a declaration demonstrating actual use had been filed and accepted.

The implementing legislation takes into account the above differences, as the Treaty requires. Also, in all respects, the benefits to applicants from the 3 year use moratorium are accorded to United States residents filing regular national applications in the United States as well as to those applicants filing under the Treaty.

A BILL

To amend the Act entitled "An Act to provide for the registration and protection of trademarks used in com-

merce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946, as amended.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that, in order to carry out the provisions of the Trademark Registration Treaty and extend its benefits to citizens and residents of the United States pursuant to the authority of Congress to regulate commerce within its control, section 1 of the Act entitled "An Act to provide for the registration and protection of trademarks used in commerce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946 (60 Stat. 427), as amended, is amended to read as follows:

"(a) Any person who is the owner of a trademark which is used or intended to be used in commerce may register that trademark on the principal register hereby established, subject to the conditions and requirements of this Act.

"(b) Application by a person described in section 1(a) to register a trademark on the principal register may be made:

(1) By paying in the Patent and Trademark Office the filing fee and filing in such Office—

(A) A written application, in such form as may be prescribed by the Commissioner, signed by the applicant or by a duly appointed representative of the applicant, specifying the applicant's domicile and citizenship and the particular goods in connection with which the trademark is used or intended to be used in commerce;

(B) A drawing of the trademark;

(C) Except where the declaration under section 1(c) is filed together with the application, a declaration of the applicant's intention to use the trademark in commerce in connection with the goods specified in the application;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By designating the United States in an international registration, or in the recording of any later designation in an international registration, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty: *Provided,* That—

(A) the person applying was entitled to file international applications, is entitled to own international registrations, and is the Owner of the international registration of the trademark sought to be registered under this Act; and

(B) a declaration of such person's intention to use the trademark in commerce in connection with the goods specified in the international registration is notified to the Patent and Trademark Office in conformity with the said Treaty.

"A person whose international application, or request for the recording of later designation, designating the United States, has been declined by the International Bureau may apply to register the same trademark under paragraph (1) of this subsection. If the application under paragraph (1) is filed in the Patent and Trademark Office prior to the expiration of two months, counted from the date of the notification by the International Bureau of its declining of the corresponding international application or request, and if the Commissioner determines that such declining was not justified, the application shall be treated as if it had been filed on the date which would have been the international registration date or the recording date of the later designation had the declining not taken place.

"(c)(1) The applicant of an application for registration under this Act, or the registrant of a registration issued on the basis of such application, shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the trademark is in use in commerce and that such use commenced on or prior to the date of expiration of three years counted from the filing date of the application, and specifying the date of his first use of the trademark, the date of his first use of the trademark in commerce, those of the particular goods identified in the registration, or, if the registration has not been issued, in the application for registration, in connection with which the trademark is used, and the mode or manner in which the trademark is used in connection with such goods. The declaration shall be signed by the registrant or his duly appointed representative, or, if the registration has not been issued, by the applicant or his duly appointed representative, and it shall be accompanied by such number of specimens or facsimiles of the trademark as actually used as may be prescribed by the Commissioner. Where the declaration concerns an application filed under, or registration issued pursuant to, section 1(b)(2), it may, in such form as may be prescribed by the Commissioner or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application to which it pertains, or later: *Provided,* That unless such declaration has been filed prior to the expiration of four years, counted from the filing date, the Commissioner shall cancel the registration, if issued, or refuse the application for registration, if pending. If the declaration is accepted in respect of fewer than all of the goods stated in the registration or identified in the application, the application or registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is in use in commerce.

(3) If an application for registration is pending after the expiration of the three-year period referred to in paragraph (1) of this subsection, or if a registration is relied upon in an opposition or cancellation proceeding under this Act which was filed, or which is pending, after the expiration of such period, the Commissioner may require that the declaration under this subsection in respect of such application or registration be filed within such earlier period as he may prescribe: *Provided,* That such earlier period shall not expire earlier than 2 months, counted from the date of a notice mailed to the applicant or registrant.

(4) If a person who applied for registration of a trademark under this Act, or any successor, assignee or related company of such applicant, shall subsequently apply for registration under this Act of the same or a substantially equivalent trademark on or prior to the date of expiration of five years from the filing date of the said earlier application in respect of all or fewer than all of the goods recited in the said earlier application, the three-year period referred to in paragraph (1) of this subsection shall, in respect of those of the goods which are the same, be counted from the filing date of the said earlier application, or if there were more than one such earlier application, from the filing date of the earliest of them: *Provided,* That this paragraph shall not be applicable if a declaration of use

conforming to the requirements of this subsection is filed together with the said subsequently filed application.

(5) Upon a satisfactory showing by the applicant or registrant that his failure to commence use of the mark in commerce on or prior to the date of expiration of the three-year period referred to in paragraph (1) of this subsection was due to extraordinary circumstances which excuse such failure and was not due to any intention to abandon the mark, the Commissioner may extend the date of expiration of the said period and of the time limit for filing the declaration under this subsection: *Provided*, That the said expiration dates may not be extended for the reason that the application for registration was pending after the date of expiration of the said three-year period.

(6) The Commissioner shall notify the applicant or registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor.

"(d) In any application in respect of which the declaration under section 1(c) has been filed, the applicant may claim concurrent use. If concurrent use is claimed, the applicant shall state exceptions to his claim of exclusive use, in which he shall specify, to the extent of his knowledge, any concurrent use by others, the goods in connection with which and the areas in which each concurrent use exists, the periods of each use, and the goods and area for which the applicant desires registration.

"(e) If the applicant is not domiciled in the United States he shall designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the trademark. Such notices or process may be served upon the person so designated by leaving with him or mailing to him a copy thereof at the address specified in the last designation so filed. Unless filed with the application, the document designating such person shall be filed on or prior to the date on which the applicant, or the registrant of any registration issued on the basis of such application, replies to any communication by the examiner, or otherwise institutes or defends any proceeding under this Act, relating to such application or registration. Until such person has been designated, or if the person so designated cannot be found at the address given in the last designation, such notices or process may be served upon the Commissioner."

SEC. 2 The first sentence of section 3 of such Act is amended by striking out "used in commerce".

SEC. 3 The first sentence of section 4 of such Act is amended by striking out "used in commerce" and by inserting, following "exercising", the words "or intending to exercise".

SEC. 4 Section 5 of such Act is amended by inserting, following "used" (first occurrence), the words ", or is intended to be used,"; and by inserting, following "use" (both occurrences), the words "or intention to use".

SEC. 5(a) The second sentence of section 7(a) of such Act is amended by inserting, following "date" (third occurrence), the words "of issue"; by striking out "date on which the application for registration was received in the Patent and Trademark Office" and inserting in lieu thereof the words "filing date"; and by changing the period at the end of the sentence to a colon and adding the following proviso:

"Provided, That if the declaration under section 1(c) has not been filed, this fact shall be indicated in lieu of the dates of first use of the mark."

(b) A new sentence is added to section 7(a) of such Act reading as follows:

"The Commissioner shall cause a notice concerning the issuance of the registration to be published in the Official Gazette of the Patent and Trademark Office."

(c) Section 7(b) of such Act is amended to read as follows:

"Subject to any conditions and limitations stated therein, a certificate of registration of a mark upon the principal register provided by this Act shall be prima facie evidence of the validity of the registration, of the registrant's ownership of the mark, and of the right of the registrant to prevent registration under this Act by any other person, except a lawful concurrent user, of the mark either in the identical form as reproduced in the registration, or in such near resemblance thereto as to be likely, when applied to the goods or services of such other person, to cause confusion or to cause mistake, or to deceive."

(d) Section 7(d) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The registrant of any registration under this Act may limit the goods and/or services specified in his registration by filing an application, in such form as may be prescribed by the Commissioner, for the recording of such limitation or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), by filing at the International Bureau a request for the recording of a limitation, in respect of the United States, of the goods and/or services of the international registration on the basis of which such registration was issued. The Commissioner shall refuse to record any limitation requested by the registrant if its effect would be to enlarge the scope of the goods and/or services beyond that of the goods and/or services specified in the registration. The recording by the International Bureau of a limitation of the goods and/or services, in respect of the United States, of an international registration shall, unless refused by the Commissioner, have the same effect as if such limitation had been entered in the records of the Patent and Trademark Office on the same date of such recording."

"(3) Where the Commissioner has limited the goods and/or services of any registration pursuant to the provisions of paragraph (2) of this subsection, or sections 1(c)(2), 8(a)(2), or 9(c)(2) of this Act, appropriate entry of such limitation shall be made in the records of the Patent and Trademark Office and, if requested by the registrant, upon the certificate of registration or, if such copy is lost or destroyed, upon a certified copy thereof."

(e) Section 7 of such Act is amended by adding, after subsection 7(g), the following new subsection:

"(h)(1) Appropriate entry shall be made in the records of the Patent and Trademark Office of any recording notified to it by the International Bureau in respect of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), unless the effect of such recording has been refused in conformity with the provisions of this Act or of the Trademark Registration Treaty.

(2) The Commissioner shall notify the International Bureau as provided in the Trademark Registration Treaty before making any entry, other than as specified in paragraph (1) of this subsection, in the records of the Patent and Trademark Office in respect of a registration issued on the basis of an application

under section 1(b)(2), or renewed pursuant to section 9(b)(2), and the entry in such records shall not be made until the corresponding entry has been annotated and published by the International Bureau as provided in the said Treaty."

SEC. 6 Section 8(a) of such Act is amended to read as follows:

"(1) The initial term of a registration under this Act shall be 10 years counted from the filing date:

Provided, That the registration of any mark under the provisions of this Act shall be cancelled by the Commissioner at the end of 6 years counted from its date of issue, unless, within 1 year next preceding the expiration of such 6 year period, the registrant shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, an affidavit or declaration showing that the mark is still in use in commerce. Special notice of the requirement for such affidavit or declaration shall be attached to each certificate of registration. Where the affidavit or declaration concerns a registration issued pursuant to section 1(b)(2), it may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the same date as the date on which it was received by the International Bureau.

(2) If the affidavit or declaration of use under paragraph (1) of this subsection is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods and/or services specified in the affidavit or declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the affidavit or declaration under this section."

SEC. 7 Section 9 of such Act is amended to read as follows:

"(a) The owner of a mark which is still in use in commerce may renew his registration of that mark for periods of ten years from the end of each expiring period of the registration, subject to the conditions and requirements of this Act.

"(b) Renewal of a registration by a person described in section 9(a) may be effected:

(1) By paying in the Patent and Trademark Office the prescribed fee and filing in such Office—

(A) within the six months next preceding the date of expiration of the period for which the registration was issued or renewed, an application for renewal; or

(B) prior to the expiration of six months counted from the date of expiration of the period for which the registration was issued or renewed, an application for late renewal, on payment of the additional fee herein prescribed;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By the renewal of an international registration in respect of which the United States is a designated State, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, *Provided:* That the person applying is entitled to own international registrations and is the Owner of the international registration of the mark sought to be renewed under this Act.

If the Commissioner refuses an application for renewal of a registration filed under paragraph (1), he shall notify the registrant of his refusal and the reasons therefor. The provisions of section 1(e) shall be applicable to any person not domiciled in the United States who applies for or effects the renewal of a registration under this Act.

"(c)(1) The registrant of a registration renewed under this Act shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the mark is still in use in commerce, and specifying those of the particular goods and/or services identified in the registration on or in connection with which the mark is so used. The declaration shall be signed by the registrant or by his duly appointed representative, and shall be accompanied by a specimen or facsimile showing current use of the mark. Where the renewal is effected pursuant to section 9(b)(2), the declaration may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application for renewal under section 9(b)(1), or, in the case of a renewal effected pursuant to section 9(b)(2), with the demand for renewal of the corresponding international registration filed with the International Bureau, or later: *Provided,* That unless such declaration has been filed prior to the expiration of six months, counted from the starting date of the term of renewal, the Commissioner shall cancel the registration. If the declaration is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the declaration under this section.

(4) The Commissioner shall notify the registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor."

SEC. 8(a) Section 10 of such Act is amended by inserting, preceding the first sentence of such section, "(a)(1)", by striking out "(d)" in the last sentence and inserting in lieu thereof "(e)", and by adding at the end of such section the following new paragraphs:

"(2) A change in the ownership of a registration or application for registration under this Act may be recorded in the Patent and Trademark Office in such form as may be prescribed by the Commissioner, or, in the case of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in Ownership, in respect of the United States, of the international registration on the basis of which such application was filed or such registration was issued. The recording by the International Bureau of a change in the Ownership, in respect of the United States, of an international registration shall, if valid,

have the same effect as if such change had been entered in the records of the Patent and Trademark Office on the same date as the date of such international recording.

"(3) The recording of a change in ownership pursuant to paragraph (2) which is the result of an assignment of the registered or applied for mark shall, as of the date of such recording, be accorded the same effects as those which are accorded to the recording of such assignment: *Provided*, That within three months from the date of notice of such recording, mailed to the person who applied therefor, or, where the recording is effected by the International Bureau, from the date of publication of such international recording, instruments of assignment conforming to the requirements of paragraph (1) have been recorded in the Patent and Trademark Office.

"(4) Any person, not entitled to file international applications, who has, nevertheless, become the owner of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), other than as a result of a contract between him and the previous applicant or registrant, may file an application for registration of the same mark under section 1(b)(1). If the application under section 1(b)(1) is filed by such person in the Patent and Trademark Office within two years from the said change in ownership and prior to six months after the expiration of the initial term, or of the then running term of renewal, of the international registration on which such application or registration is based, it shall, in respect of those of the goods and/or services which are the same, be treated as if it had been filed on the same date as the date on which the designation of the United States in such corresponding international registration took effect: *Provided*, That such application under section 1(b)(1) conforms to all of the requirements of this Act."

(b) Section 10 of such Act is amended by adding the following subsections:

"(b) Instruments evidencing changes in the name of the applicant or registrant may be recorded in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, or, in the case of a registration issued on the basis of an application filed under section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in the name of the Owner of the international registration on the basis of which such registration was issued. The recording by the International Bureau of a change in the name of the Owner of an international registration, in which the United States is a designated State, shall, if valid, have the same effect as if it had been entered in the records of the Patent and Trademark Office on the same date as the date of such recording.

"(c) Where at any time, as a result of a final decision in any proceeding under this Act, it is determined that a recording made under this section is void or that such recording was made contrary to the requirements of the Act, the Commissioner shall, upon request of any interested party, cause an appropriate correction to be entered in the records of the Patent and Trademark Office. If such recording was effected on the basis of a recording in respect of an international registration, the Commissioner shall, if appropriate, deny the effect of such international recording and notify the International Bureau accordingly, as prescribed in the Trademark Registration Treaty."

SEC. 9 Section 12(a) of such Act is amended to read as follows:

"Upon the filing of an application for registration, the Commissioner shall refer the application to the examiner in charge of the registration of marks, who shall cause an examination to be made. Unless the application has been previously withdrawn or abandoned, the mark shall be published in the OFFICIAL GAZETTE of the Patent and Trademark Office at such time as the Commissioner shall prescribe, not later than 12 months, counted from the filing date of the application. In the case of an applicant claiming concurrent use, or in the case of an application to be placed in an interference as provided for in section 16 of this Act, the mark may be published subject to the determination of the rights of the parties to such proceedings."

SEC. 10 Section 12(b) of such Act is amended by striking out "6" in two places and inserting, in lieu thereof "3" and by adding at the end thereof:

"Except for the failure of an applicant to comply with the requirements of section 1(c), no mark shall be refused registration for a reason which has not been indicated in a communication given or mailed to the applicant on or prior to 12 months, counted from the filing date: *Provided*, That this limitation shall not apply to any refusal determined by the Trademark Trial and Appeal Board or by a court."

SEC. 11 The second sentence of section 13 of such Act is amended by changing the period at the end of this sentence to a colon and adding a proviso and a new third sentence reading as follows:

"*Provided*, That such time shall in no event be extended to a date which is later than 14 months, counted from the filing date of the application for registration in respect of which the extension of time for filing opposition is requested. An opposition may be filed by a duly authorized attorney of the opposer."

SEC. 12 Section 14 of such Act is amended by inserting, following "person" the words, "or by a duly authorized attorney of any person"; by inserting, following "date" in clause (a), the words "of issue", and by inserting, following "thereunder", in clause (c), the following words:

"or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), on the ground that the registrant was not entitled to own international registrations,".

SEC. 13 The first sentence of section 15 of such Act is amended by inserting, following the third occurrence of "date", the words "of issue".

SEC. 14 The first sentence of section 16 of such Act is amended by inserting, following "may" the words ", prior to the publication under section 12(a) of such mark,".

SEC. 15 Section 17 of such Act is amended by inserting, between the first and second sentences thereof:

"Where an interference, opposition to registration or concurrent user proceeding concerns an application for registration under this Act of a mark, the entitlement to registration of which has not been finally determined by the examiner in charge of the registration of marks or, as a result of an appeal from a final refusal of the examiner, by the Trademark Trial and Appeal Board or a court, the Commissioner may, with notice to all parties, defer the commencement of such proceeding until such final determination has been made."

SEC. 16 The first sentence of paragraph (1) of section 21(a) of such Act is amended by inserting, following "affidavit", the words "or declaration"; and by striking out "section 8" and inserting in lieu thereof "section 8, 1(c), or 9(c)".

SEC. 17 Section 22 of such Act is amended by inserting, at the beginning of the sentence, "Issuance of a" and by changing the "R" in "Registration" to "r".

SEC. 18 Section 23 of such Act is amended by inserting, following "commerce" in the second sentence of such section, ", or are intended to be used in commerce,"; by striking out in the second sentence of such section "for the year preceding the filing of the application"; by inserting between the second and third sentences of such section: "An application for the registration of a mark shall be treated as an application under this section only if the application or, in the case of an application pursuant to section 1(b)(2), if the international registration or recording of later designation which is the basis for such application, contains an indication to this effect."; and by striking out in its entirety the last sentence of such section.

SEC. 19(a) The second sentence of section 24 of such Act is amended by inserting, preceding "may," the words ", or his duly authorized attorney," and by striking out the word "verified".

(b) The fourth sentence of section 24 of such Act is amended by inserting, following "used", the words ", following the date of expiration of the period referred to in section 1(c)(1),".

SEC. 20 The second sentence of section 30 of such Act is amended to read as follows:

"When the goods and/or services specified in an application fall within a plurality of classes, a fee equalling the sum of the fees for filing an application in each class shall be paid, and the Commissioner may issue a single certificate of registration for such mark."

SEC. 21(a) Subsection (a) of section 31 of such Act is amended by striking out paragraph (3) of such subsection, by appropriately renumbering the remaining paragraphs; and by inserting, following "mark" in newly renumbered clause (6) (old paragraph (7)), ", change in the name of the registrant,".

(b) Section 31 of such Act is amended by adding, after subsection 31(c), the following new subsection:

"(d) The fees specified in paragraphs (1) and (2) of subsection (a) shall, in the case of applications pursuant to section 1(b)(2) and renewals pursuant to section 9(b)(2), be deemed to be substituted for, respectively, by the individual State fees and the individual State renewal fees applicable to designations of and renewals concerning the United States pursuant to the Trademark Registration Treaty. The Commissioner shall communicate to the International Bureau the amounts of such individual State fee and individual State renewal fee and such amounts shall be the same, respectively, as the amounts of the fees specified in paragraphs (1) and (2) of subsection (a)."

SEC. 22 Section 32(1) of such Act is amended by adding at the end of such section the following sentence:

"No action under this section may be started by the registrant of a registration issued under this Act until the declaration under section 1(c) in respect of the mark which is the subject of such registration has been filed in the Patent and Trademark Office and accepted by the Commissioner."

SEC. 23(a) Section 33(a) of such Act is amended by inserting following "registration" (second occurrence), the words ", and in respect of which the mark is stated to be in use in commerce in the registration, or in the declaration under section 1(c) which has been filed in the Patent and Trademark Office and accepted by the Commissioner,"

(b) Paragraph (5) of section 33(b) of such Act is amended by inserting, preceding "registration" the words "the date of issue of the".

(c) Section 33 of such Act is amended by adding, after subsection 33(b), a new subsection reading as follows:

"(c) For the purpose of determining priority of rights in any proceeding under this Act, an application for registration of a mark which has not been withdrawn or abandoned or a registration issued on the basis of such application, shall, from and after its filing date, be accorded the same effect as if the applicant, or the registrant, had commenced use of the mark in commerce on the said filing date, without derogation, however, of any earlier priority based on use of the mark commenced earlier than the said filing date or of any right of priority to which the applicant or registrant may be entitled pursuant to section 44(d) of this Act."

SEC. 24 Section 35 of such Act is amended by adding at the end of such section the following sentence:

"Any remedy under this section shall relate only to the period after the registrant commenced the continuing use of the mark in commerce."

SEC. 25 Section 44(a) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The Commissioner shall keep a register of international registrations designating the United States which have been published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, including renewals thereof and recordings related thereto, and shall be authorized to accord and refuse effects, communicate notifications, make attestations, decide petitions, determine the amounts of and receive payments of fees, and perform all other acts prescribed by the said Treaty, subject to the requirements thereof.

"(3) Where the time limit for a notification to the International Bureau prescribed by the Trademark Registration Treaty is stated in terms of the date of receipt of such notification by the International Bureau, such notification shall be transmitted by Registered Mail no later than 14 days prior to the expiration of the time limit and, except where an agency of the said Bureau, established pursuant to the said Treaty, is operating within the United States, shall be transmitted to that bureau via Air Mail.

"(4) A mark subject of an application under section 1(b)(2) in respect of which no notification of refusal or possible refusal was received by the International Bureau within the time limit fixed in Article 12(2)(a)(i) of the Trademark Registration Treaty shall be automatically entitled to registration under this Act on the same register as the one for which such application was made. Upon request by the applicant of such an application and unless the registration has been previously issued, the Commissioner shall issue the registration to which such applicant is entitled under this paragraph and the date of issue of such registration shall be the date of the OFFICIAL GAZETTE next preceding the date of expiration of the said time limit. Registration of a mark under the provisions of this paragraph shall be without prejudice to the right of any person to petition to cancel such registration under section 14 of this Act for any reason, including one which was referred to in a refusal made pursuant to section 12(b) or in an opposition filed pursuant to section 13, the notification of which was not received by the International Bureau or which was not received by such Bureau within the said time limit. If a registration is

issued pursuant to this paragraph in respect of a mark, the registration of which had been opposed in a timely filed opposition, the Commissioner shall notify the opposer in such opposition and shall, upon request of such opposer received within 30 days from the date of such notice, direct the Trademark Trial and Appeal Board to determine and decide the rights of registration as if the opposition to registration had been filed as an application to cancel the said registration on the date of issue of such registration.

"(5) Failure by the applicant of an international application or by the Owner of an international registration to act within prescribed time limits in connection with requirements pertaining to an international application, international registration or later designation designating the United States, or to any recording related thereto, may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the Trademark Registration Treaty or by this Act."

SEC. 26 Section 44(c) of such Act is amended by striking out the first sentence of such section; and by striking out the heading, preceding the second sentence, "Country of origin defined."

SEC. 27 Section 44(d) of such Act is amended to read as follows:

"An application for registration of a mark under sections 1, 2, 3, 4 or 23 of this Act filed by a person described in paragraph (b) of this section who has previously duly filed an application for registration of the same mark in one of the countries described in paragraph (b), or a regular international application in respect of the same mark designating at least one country other than the United States, shall be accorded the same force and effect as would be accorded to the same application if filed under this Act on the same date on which such application was first filed in such foreign country, or on which such international application was first filed with the International Bureau: *Provided*, That—

(1) The application under this Act is filed within 6 months from the date on which the application was first filed in the foreign country or on which the international application was first filed with the International Bureau;

(2) The rights acquired by third parties before the date of the filing of the first application in the foreign country or of the first international application shall in no way be affected by a registration obtained on an application filed under this subsection (d);

(3) Nothing in this subsection (d) shall entitle the owner of a registration granted under this section to sue for acts committed prior to the date on which such registrant has commenced the continuing use of the mark in commerce.

In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed foreign application or subsequent regular international application, instead of the first filed foreign application or international application: *Provided*, That any foreign application or international application filed prior to such subsequent application or international application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority."

SEC. 28(a) The paragraphs headed "Trademark," "Service Mark," "Certification Mark," "Collective Mark" and "Intent of Act" in section 45 of such Act are amended by inserting, following each occurrence of "used", the words "or intended to be used".

(b) Clause (a) of the paragraph in section 45 of such Act headed "Abandonment of Mark" is amended to read as follows:

"(a) when its use has not commenced and there is no intent to commence use or when its use has been discontinued with intent not to resume. Lack of intent to commence or intent not to resume may be inferred from the circumstances. If use of a mark has been discontinued, its nonuse for two consecutive years shall be prima facie abandonment."

(c) Section 45 of such Act is amended by adding the following paragraphs:

"Filing date. The filing date of an application for registration under section 1(b)(1) shall be the date on which all of the elements prescribed by the Commissioner as minimum elements for according a filing date have been received in the Patent and Trademark Office. The filing date of an application for registration under section 1(b)(2) shall be the same date as the international registration date of the international registration or, if applicable, the recording date of the later designation, on the basis of which such application is filed."

"Date of issue. The date of issue of a registration under this Act is the date of the issue of the OFFICIAL GAZETTE of the Patent and Trademark Office in which the notice concerning the issuance of the registration appears."

"Trademark Registration Treaty. The term "Trademark Registration Treaty" means the Treaty so entitled, done at Vienna, Austria, on June 12, 1973, including the Regulations under the said Treaty."

"International application, international registration, request for the recording of later designation, recording of later designation, International Bureau, regular international application, individual State fee, individual State renewal fee. The terms "international application", "international registration", "request for the recording of later designation", "recording of later designation", "International Bureau", "regular international application", "individual State fee" and "individual State renewal fee" are to be taken in the sense indicated by the Trademark Registration Treaty."

"Owner, Ownership. The terms "Owner" and "Ownership" are to be taken in the sense indicated by the Trademark Registration Treaty where they appear in this Act in capitalized form."

"Owner of a trademark. The term "owner of a trademark" means a person who is using, or who has an intention to use, a trademark in commerce: *Provided*, That no other person, except a lawful concurrent user, has the right to use, and is using or has previously declared, in an application filed under this Act which has not been withdrawn or abandoned, his intention to use, such mark in commerce either in the identical form thereof or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive."

SEC. 29(a) This Act shall come into force on the same date as the entry into force of the Trademark Registration Treaty with respect to the United States. It shall apply to applications for registration of marks filed in the Patent and Trademark Office on or after such date, even though entitled to an earlier effective filing date, and to registrations issued on the basis of such applications; to international applications and later desig-

nations designating the United States filed with the International Bureau on or after such date, even though entitled to an earlier effective filing date, and to international registrations accorded effects in the United States on the basis of such international applications and later designations; and to proceedings under the Trademark Act of 1946, as amended, commenced on or after such date.

(b) Except as otherwise hereafter provided, applications for registration of marks on file in the Patent and Trademark Office on the date this Act comes into force, registrations issued on the basis of such applications, and proceedings under the Trademark Act of 1946, as amended, which are pending on such date, shall be governed by the provisions of the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(c) Except as otherwise provided hereafter in this section, all registrations under the Trademark Act of 1946, as amended, or under the previous Acts specified in section 46(b) of such Act, existing on the date this Act comes into force shall be governed by the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(d) The provisions of section 9 of the Trademark Act of 1946, as amended, as amended by this Act, shall apply to all registrations under such Act and under the previous Acts specified in section 46(b), whether issued or applied for before, on, or after the date this Act comes into force: *Provided*, that the amendments to such section by this Act shall not apply to the renewal of any registration for any period which started on a date which is earlier than six months after such date.

(e) The amendment by this Act, of the Trademark Act of 1946, as amended, shall not affect any rights or liabilities existing under such Act in effect immediately prior to the date this Act comes into force.

SECTIONAL ANALYSIS

SECTION 1 of the bill amends section 1 of the Trademark Act of 1946, as amended (hereinafter referred to as Trademark Act) [1] in a number of respects. The preamble makes it clear that the commerce clause as well as the treaty power is invoked to support the amendments. Section 1 of the amended Trademark Act is divided into five subsections, each of which is separately discussed below:

Section 1(a) *Entitlement to registration of a trademark.* Entitlement to registration is changed from present law in one fundamental respect. This is that intention to use, as well as actual use of, a trademark is a valid basis for ownership and registration. The other conditions are essentially the same as under present law.

The applicant must be a "person", as defined in section 45. The definition of "person" has not been changed.

As under the present statute, the applicant must be the "owner" of the trademark sought to be registered. The concept of ownership is modified as necessary to be consistent with the new alternative basis of rights. Also, rather than being part of the verified statement, the definition of "owner of a trademark" is in section 45.

The term "owner" is defined, as under present law, in respect of the absence of a superior right in any other person. What is new is that a claim of ownership is defeated not only by the superior right of a prior *user* of the same or a similar mark but also by the superior right of one who has a prior *intention to use* such a mark. However, the latter right can defeat the claim of ownership *only* if the intention to use has been previously declared in an application filed under the Act which has not been withdrawn or abandoned. Accordingly, while a person acquires (absent a superior right) an ownership right by reason of his intention to use a trademark, the right in that case is inchoate and is accorded no protection under the statute and no priority until it has been fixed in an application filed under the Act in which the intention to use is declared. Thus, filing the application is critical to a claim of ownership by intention to use and except, of course, where the Paris Convention "right of priority" (i.e. section 44(d)) is invoked, the filing date is the earliest date on which such a person can rely in a priority contest. (See SECTION 23(c))

Finally, the use or intended use must be in commerce. The definition of "commerce" is not changed. The outside parameters of "intended use in commerce" are left to interpretation just as has been the case with "use in commerce" under the present statute, and the principles that would be applied in such interpretation are essentially the same.

Section 1(b) *Procedure for applying to register a trademark.* Under the amended Act, there are two basic procedures for securing the registration of a trademark, i.e. by filing an application in the Patent and Trademark Office (section 1(b)(1)) and by designating the United States in an international registration pursuant to the Trademark Registration Treaty [2] (section 1(b)(2)). Except for the place where the application is filed and the fee is paid, the substantive requirements applicable to the alternative procedures are essentially the same.

Section 1(b)(1) *Domestic procedure.* In order to achieve harmonization of domestic and international procedures, the following changes are made in the national application procedures.

1. The application may be signed by a representative, duly appointed by the applicant, as an alternative to signing by the applicant himself. The same benefit is provided to applicants filing under the Trademark Registration Treaty (Article 26).

2. Consistent with the requirements of the Trademark Registration Treaty and modern practice in regard to the filing of statements with federal agencies the verification of ownership requirement has been eliminated.

Of course, the criminal provisions of 18 U.S.C. 1001 would remain applicable to a statement made in a trademark application irrespective of whether such statement is verified.

3. The applicant need not allege use of the mark in his application. The Trademark Registration Treaty prohibits such a requirement (Article 19(3)(a)) for the owners of international registrations; consequently, the same benefit is accorded to persons filing regular national applications. Substituted for this requirement is the declaration of intention to use the mark in commerce, which *is* permitted by the Treaty (Article 19(4)). Consistent with this change, specimens or facsimiles of the mark as actually used need not be submitted with the application.

It should be noted that required allegations and exhibits relating to actual use according to the present statute are

[1] Public Law 489, 79th Congress, approved July 5, 1946; 60 Stat. 427. Amendments have been effected by the following public laws.
P.L. 710, 81st Cong., 64 Stat. 459, 8–17–50.
P.L. 593, 82nd Cong., 66 Stat. 792, 7–19–52.
P.L. 609, 85th Cong., 72 Stat. 540, 8–8–58.
P.L. 333, 87th Cong., 75 Stat. 748, 10–3–61.
P.L. 772, 87th Cong., 76 Stat. 769, 10–9–62.
P.L. 89–83, 89th Cong., 79 Stat. 260, 7–24–65.
P.L. 93–596, 93rd Cong., 88 Stat. 1949, 1–2–75.
P.L. 93–600, 93rd Cong., 88 Stat. 1955, 1–2–75.

[2] Done at Vienna, Austria, June 12, 1973. This is the Treaty which was transmitted by the President to the Senate for advice and consent to ratification on September 3, 1975. *Congressional Record* 9/3/75, S. 15139.

retained in section 1(c). It should also be noted here that the applicant *may* file the section 1(c) declaration together with his application (section 1(c)(2)), if the mark is already in use in commerce. In such case, the declaration of intention to use is obviously superfluous and need not be made.

Section 1(b)(2) *International procedure.*

This paragraph states the requirements which must be satisfied in order to secure the effect of a United States application, i.e. the effect required by the Trademark Registration Treaty (Article 11(1)).

The provisions of Article 19(4) of the Treaty, requiring a declaration of intention to use, are also implemented, corresponding to the same requirement in section 1(b)(1)(C) for domestic applicants.

Finally, a special requirement as to entitlement of a foreign applicant to use the Trademark Registration Treaty (Article 4) has been added since the International Bureau will only examine this question formally, leaving it to the designated States to examine it as to substance. Thus, non-entitlement of a foreign applicant to use the Treaty procedure is a ground for refusal (Article 12(1)(ii)) or cancellation (Article 13(1)(ii)) in addititon to the grounds applicable under the national law.

The final two sections of section 1(b) implement part of Article 9 of the Treaty whereunder the improper declining of an international application or later designation request by the International Bureau can be rectified by filing a regular domestic application within 2 months from the notice of the declining.

Section 1(c) *Declaration of use.*

Section 1(c) calls for a declaration of use showing that use of the mark commenced on or prior to the date of expiration of three years, counted from the filing date. Paragraph (1) requires the declaration to contain essentially the same information as that required by present section 1.

Paragraph (2) prescribes a time limit of four years, counted from the filing date, within which the declaration may be filed, and indicates the consequences of failure to file an acceptable declaration.

Paragraph (3) authorizes the Commissioner to require the earlier filing of a declaration when important relative to an issue in any Office proceeding, provided that the three-year period has expired.

Paragraph (4) prevents abuse of the intention to use provisions by a person filing successive applications for the same, or a substantially equivalent, mark by providing that, unless there is a gap of at least two years between the expiration of the nonuse moratorium of the earlier case and the date of filing of the later case, the three-year period in the later case is measured from the filing date of the earlier case. Any subsequent application which is accompanied by a declaration of use is excluded from the special provisions.

Paragraph (5) provides for an extension of the time limits when due to extraordinary circumstances nonuse is excusable. The proviso expressly states, however, that the mere pendency of the application for registration as of the expiration of the three-year period shall not justify an extension, making it clear that Article 19(3)(b) of the Trademark Registration Treaty does not apply in the United States.

Paragraph (6) requires the Commissioner to give notice regarding acceptance or refusal of a declaration.

Section 1(d) *Special requirement for concurrent use applications.*

This provision, unchanged from present law, is placed in a separate subsection because its applicability is limited to applications wherein the section 1(c) declaration of use has been filed.

Section 1(e) *Special requirement for applicants not domiciled in United States.*

This subsection requires all applicants not domiciled in the United States to designate an agent for service on or prior to the institution or defense of a proceeding under this Act. Before a local agent for service has been designated, service may be made upon the Commissioner.

SECTIONS 2 and 3 of the bill amend sections 3 and 4 of the Trademark Act so that service marks and collective and certification marks may be registered based on either use or intention to use.

SECTION 4 of the bill amends section 5 of the Trademark Act to provide that the intended use by a related company inures to the benefit of the registrant or applicant.

SECTION 5(a) of the bill amends section 7(a) of the Trademark Act to take into account the fact that registrations issued on the basis of intent applications would not, if the declaration of use has not been filed, contain any data concerning use of the mark. In such cases, the fact that the declaration has not been filed would be indicated in the registration in lieu of the indications as to use. Also, the term "date of the registration" has been deleted, the significant dates under the amended statute being the "filing date" and the "date of issue."

SECTION 5(b) amends section 7(a) by requiring a notice of registration to be published in the OFFICIAL GAZETTE in support of the definition of "date of issue" in section 45.

SECTION 5(c) amends section 7(b) of the Trademark Act by deleting the presumption of the registrant's exclusive right to use the registered mark in commerce on the goods specified in the registration. One reason is that this presumption in the present statute is repeated in section 33(a).

The other reason is that this presumption, as it pertains to infringement actions, must be limited to be consistent with the limitation on the right even to file an infringement action prior to the commencement of use (see SECTION 23(a)).

Deletion of the "exclusive right to use" presumption from section 7(b) leaves a gap in the statute, however, the bringing of Patent and Trademark Office proceedings, i.e. oppositions and cancellations is not subject to the above mentioned limitation. The exclusive right to use presumption has served in such proceedings as the basis of the ruling that a registrant is entitled to rely solely upon his registration on the principal register as prima facie evidence of his right to exclude any other person from securing a registration under the Act of a confusing mark. Therefore, a presumption as to this right has been added.

SECTION 5(d) of the bill amends section 7(d) by adding two new paragraphs which provided domestic and international procedures, consistent with present law and with the Treaty, for amending a registration in respect of the specification of goods and/or services.

SECTION 5(e) of the bill amends section 7 by adding a new subsection, section 7(h), providing for appropriate notification, consistent with Article 20 of the Treaty, with respect to entries concerning registration based on international registrations.

SECTION 6 of the bill amends section 8(a) of the Trademark Act by changing the term of a registration from 20 to 10 years and the date from which the terms is measured from the registration date to the filing date. These changes correspond the term of domestic registrations to that of registrations secured under the Trademark Reg-

istration Treaty. The shorter term also facilitates the clearing from the register of unused marks.

The section is also amended to require that the use declared in the affidavit or declaration set forth in the proviso, i.e. the present section 8 affidavit, be use "in commerce".

Finally, the section is amended to permit, consistent with the requirement in the Treaty (Article 19(3)(d)), that such affidavit or declaration requirements be capable of being fulfilled in the case of an international registration by filing with the International Bureau.

SECTION 7 of the bill amends section 9 of the Trademark Act to set forth domestic and international procedures for renewal and to provide equivalent treatment, as to substantive requirements, of international and domestic registrants. Thus, as in the case of an application for registration, the renewal application may be signed by a representative, duly appointed by the registrant.

Two changes are made in the statute which conform to the Treaty, as follows:

1. The term of renewal is 10 years rather than 20, consistent with the Treaty (Article 17).
2. The time period, counted from the expiration date of the expiring term, in which a late renewal application can be filed is increased from three months to six months, corresponding to Article 17(3)(a).

Section 9(c) requires a declaration of use which requirement is applicable to all renewed registrations. Other than the three additional months in which to declare use of the mark, the only difference from present law is that the consequence of failure to satisfy the requirement is cancellation of the registration rather than refusal to renew.

SECTION 8(a) of the bill amends section 10 of the Trademark Act in several minor respects. Except for a technical change, the present provision for recording of assignments (section 10) is not changed.

Three new paragraphs have been added to the assignment section. The first two of these (i.e. 10(a)(2) and 10(a)(3)) implement Article 14 of the Treaty, under which a change in the ownership of an international registration may be recorded, by adding equivalent procedures to the national law. Thus, any applicant or registrant may record the fact that a new person has become the owner of an application filed or registration issued under the Act by complying with certain basic formalities. Paragraph (3) provides that if this step is taken within the period specified in paragraph (1) and it is followed up by the recording of instruments of assignment conforming to the requirements of paragraph (1), the constructive notice effect of recording an assignment in the Office will accrue.

The third additional paragraph (i.e. 10(a)(4)) is a special provision, implementing Article 14(5), for the benefit of one who, although not entitled to file under the Treaty, becomes the owner of an international registration by operation of law (e.g. by inheritance). Such a person may, subject to special requirements, rectify this defect by filing a regular national application.

SECTION 8(b) of the bill amends section 10 of the Trademark Act by adding two new provisions. The first of these (Section 10(b)) adds a new procedure, consistent with Article 15 of the Treaty, for recording a change in the name of the registrant.

Subsection (c) is added to clarify the procedure where a recording is void. Recordings under subsections (a) and (b) may later be determined to be void or contrary to law in another proceeding (cancellation, infringement action, etc.) under the Act. A specific provision has been added to clarify the fact that the Commissioner has the authority to correct the records and to provide a basis for denial of any international recording which formed the basis of the national entry.

SECTION 9 of the bill amends section 12(a) of the Trademark Act to provide for a "cut off" in the length of the ex parte examination of twelve months counted from the filing date of the application. Under amended section 12(a) all applications, the examination of which has not been completed, would have to be published for opposition purposes no later than 12 months from the filing date.

The reason for 12 months as the "cut off" is that the time required to effect publication, to receive oppositions (including delays in processing oppositions received on the last day), and to communicate, in the case of international registrations, all grounds of refusal or possible refusal to the International Bureau, must be taken into account in order to meet the deadlines prescribed by the Treaty (see Article 12).

It should be noted that the exact schedule for publication is left to determination by the Commissioner. There are, at least, two possibilities: (1) publication, promptly after filing, of all applications; and (2) publication (of allowed cases) after completion of the ex parte examination (as at present), or (of all still pending cases) at the expiration of 12 months, whichever event is the earlier to occur.

SECTION 10 of the bill amends section 12(b) of the Trademark Act by reducing the period of time in which to reply to an Office communication concerning the application from six to three months and by providing a time limitation applicable to notifying the applicant of grounds raised during the ex parte examination. The reduction of response time should make it possible for the Office to complete the ex parte examination of most applications within the 12 months period of amended section 12(a).

The cut off is the same as the one in amended section 12(a), i.e. 12 months, counted from the filing date. The examination need not be completed within the 12 months as the Treaty requirement is only that all grounds be communicated within that period. Also, the limitation would not apply to a new ground of refusal based on a decision of the Trademark Trial and Appeal Board or of a court.

SECTION 11 of the bill amends section 13 of the Trademark Act by providing for a time limit of 14 months for receiving oppositions. The 14 month time limitation ties in with the amendment to section 12(a) of the Act, providing equivalence of treatment of domestic and Treaty applicants. Section 13 is also amended to provide that an attorney may file an opposition on behalf of the opposer.

SECTION 12 of the bill amends section 14 of the Trademark Act in two respects, conforming this section to amended section 13, and a minor change in terminology ("date of issue").

SECTION 13 of the bill amends section 15 of the Trademark Act by a minor change in terminology ("date of issue").

SECTION 14 of the bill amends section 16 of the Trademark Act by providing specifically that an interference may be declared as to any particular application for registration of a mark only prior to the publication for opposition of that mark. While this is no different than current practice, the change in the statute seemed desirable. Since the declaration of an interference would constitute a ground of possible refusal under the Trademark Registration Treaty, such ground would have to be notified to the International Bureau within the prescribed time limit.

By requiring the declaration of the interferences prior to the date of publication, the section is subject to the same time limitation as in amended section 12(a), i.e. 12 months from the filing date.

SECTION 15 of the bill amends section 17 of the Trademark Act by providing discretionary authority to the Commissioner to defer the commencement of certain inter partes proceedings where the ex parte examination of a concerned application is not complete.

SECTION 16 of the bill amends section 21 of the Trademark Act by providing for an appeal from a refusal to accept a declaration pursuant to sections 1(c) and 9(c), as is now provided in the case of refusal of a section 8 affidavit.

SECTION 17 of the bill makes a language change in section 22 of the Trademark Act, consistent with the change from "date of registration" to "date of issue". Thus, constructive notice begins with publications of issuance of the registration (date of issue), no different in substance than under present law.

SECTION 18 of the bill amends section 23 of the Trademark Act by eliminating the requirements and provisions relating to use in the first and fourth paragraphs. Also, provision is made for treatment of applications as being under this section only where the application or the international registration (or recording of later designation) so indicates. The specific reference implements Article 11(3) which requires this treatment in the case of international registrations.

SECTION 19(a) of the bill amends section 24 of the Trademark Act by deleting the requirement that a petition to cancel a registration on the Supplemental Register be verified (consistent with amended section 14).

SECTION 19(b) of the bill amends section 24 of the Trademark Act by limiting the authority to cancel a registration on the Supplemental Register for nonuse, consistent with the use moratorium of the Treaty.

SECTION 20 of the bill amends section 30 of the Trademark Act in minor respects to remove an incidental reference to use of a mark that is inconsistent with amended section 1.

SECTION 21(a) of the bill amends section 31 of the Trademark Act by deleting the requirement of a fee for the filing of a section 8 affidavit. Since a section 8 fee cannot be assessed against a registration issued on the basis of an international registration (Article 19(1)), it is deleted in order to provide equivalence between domestic and Treaty applicants as to fees payable to the United States.

SECTION 21(b) of the bill amends section 31 of the Trademark Act by adding new subsection (d) whereby the filing and renewal fees are deemed to be substituted for by the corresponding fees set forth in the Treaty, where the international procedure is followed. This provision also obligates the Commissioner to fix the Treaty fees at the same amounts as the national fees.

SECTION 22 of the bill amends section 32(1) of the Trademark Act by providing that no infringement action may be started under the Act until the declaration of use of the mark in commerce has been filed in the Patent and Trademark Office and accepted by the Commissioner. This change implements the last sentence of Article 19(3)(a). Examination of the declaration could be accelerated if the registrant faced an impending infringement situation.

SECTION 23(a) of the bill amends section 33(a) of the Trademark Act so that the presumption of exclusive right to use the mark would apply as a rule of evidence only as to those goods and/or services in respect of which the mark is stated to be in use in commerce either in the registration itself or in the declaration under section 1(c).

SECTION 23(b) makes some minor changes in the language of section 33(b).

SECTION 23(c) amends section 33 of the Trademark Act by adding a new subsection (c) to define priority of rights accorded to applications or registrations based on an intention to use the mark. Under new subsection (c), the priority of an intent applicant or registrant would be *the same as if* he had commenced use of the mark in commerce on the filing date, unless, of course, he had an earlier priority based on use or based on the Paris Convention priority provisions of section 44(d) of the Act.

SECTION 24 of the bill amends section 35 of the Trademark Act in order to implement the last sentence of Article 19(3)(a) so that the remedies of profits and damages cannot date back prior to the date of commencement of use.

SECTION 25 of the bill renumbers present section 44(a) of the Trademark Act as section 44(a)(1) and adds to it some special provisions relating to the Trademark Registration Treaty.

Paragraph (2) authorizes the Commissioner to keep a register of international registrations designating the United States.

Paragraph (2) also contains a broad implementing provision, authorizing the Commissioner to take various actions prescribed by the Treaty. While all of the essential Treaty provisions parallel to provisions concerning domestic applications and registrations have been specifically implemented, a large number of Treaty provisions remain which solely concern the international procedures.

Paragraph (3) prescribes a procedure for communicating notifications where the deadline is stated in terms of the date of receipt by the International Bureau, most importantly the notification of refusal or possible refusal under Article 12(2)(a)(i).

Paragraph (4) implements Article 11(2)(i) of the Treaty providing for automatic registration as of the date of expiration of the time limit fixed in Article 12(2)(a)(i) where no notification of refusal or possible refusal has been received by the International Bureau.

Paragraph (5) implements Article 29 of the Treaty whereby certain delays in meeting the time limits fixed in the Treaty must be waived and others may be waived. There are some specific exceptions in the Treaty which is the reason for the last clause in this paragraph.

SECTION 26 of the bill amends section 44(c) of the Trademark Act by deleting the first sentence of this subsection. Since a person can secure a registration based on an intention to use the mark in commerce, the sentence is inconsistent with the amended Act. However, the sentence is no longer necessary. Under the amended Act all applicants would be required to declare use or an intention to use in commerce, whether or not the mark is also registered in the country of origin.

SECTION 27 of the bill deletes present subsection 44(d) of the Trademark Act and substitutes therefor a subsection providing that a right of priority may be based on a first international application as well as a first national application. Paragraph (2) of present subsection (d) is not continued. Waiver of use in commerce is no longer necessary since an application need not allege use under the amended Act. Old paragraph (4) (new paragraph (3)) of the subsection is amended to be consistent with the first sentence of section 44(c).

SECTION 28(a) of the bill amends the definitions, in section 45 of the Trademark Act, of the terms "trademark,"

"service mark," "certification mark," "collective mark" and "Intent of Act" by adding the phrase, "or intended to be used" in appropriate places consistent with the new basis for securing registrations.

SECTION 28(b) of the bill amends the definition, in section 45 of the Trademark Act, of "abandonment" to provide for abandonment of a mark applied for based on an intention to use where no use is commenced and there was never any intention to commence use. The two year prima facie abandonment provision is amended to make it clear that it applies only where use of a mark is discontinued.

SECTION 28(c) of the bill amends section 45 of the Trademark Act by adding the following new definitions:

(1) "Filing date" is defined because of its significance in respect of priority of rights in the case of an application or registration based on the intention to use;

(2) "Date of issue" is defined;

(3) "Trademark Registration Treaty" is defined;

(4) Various terms used in respect of the Trademark Registration Treaty are referenced to the Trademark Registration Treaty definitions;

(5) The terms "Owner" and "Ownership," used in capitalized form are referenced to the Trademark Registration Treaty.

This was done in order to distinguish these references from other references in the statute to "owner" or "ownership" which refer to the owner, or ownership, of a mark.

Finally, the term "owner of a trademark" is defined. The reason for this definition is discussed under SECTION 1, infra.

SECTION 29 of the bill prescribes the implementation of the various changes effected by the bill. The effective date of the Act coincides with the entry into force of the Treaty with respect to the United States. Appropriate provisions specify the controlling law which is applicable before, or on or after, the effective date.

---

(97) TRADEMARK APPLICATIONS UNDER SECTION 44 OF THE TRADEMARK ACT OF 1946

[37 CFR Parts 2 and 4]

Withdrawal of Proposed Rules

AGENCY: Patent and Trademark Office, Commerce.
ACTION: Withdrawal of proposed rules.

SUMMARY: The Patent and Trademark Office hereby withdraws its rule proposals (FR Doc. 77-23095 published in the Federal Register on August 10, 1977, 42 FR 40450; 962 TMOG 2-4, September 6, 1977) regarding applications filed under section 44 of the Trademark Act of 1946.

Under the proposed rules, foreign applicants filing under section 44 (d) or (e) of the Trademark Act of 1946, as amended, 15 U.S.C. 1126, would no longer have been required to allege use of the mark somewhere or to submit specimens or facsimiles demonstrating such use.

The primary consideration for the withdrawal of this rules proposal was the strong objection voiced by several commenters that the proposed rule changes would have placed some United States nationals in a less favorable position than foreign nationals than is the case under the present rules.

EFFECTIVE DATE: June 30, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703-557-2521.

SUPPLEMENTARY INFORMATION: A notice was published in the OFFICIAL GAZETTE of the United States Patent and Trademark Office on April 30, 1974 (921 OG TM 250) detailing the procedure being followed by this Office in connection with applications filed under section 44 of the Trademark Act of 1946 without specimens and without a statement of use of the mark. That notice is hereby withdrawn and the procedure thereunder terminated. Henceforth, in order to receive a formal filing date, an application under section 44 must include in the application at least one specimen and a statement that the mark has been used.

Those applicants having cases now under suspension in this Office in accordance with the April 1974 OFFICIAL GAZETTE notice will be notified individually of the Office policy regarding specimens and use as set out above.

Finally, the withdrawal of this rules proposal should in no way be interpreted as a diminution of the continuing support of the Department of Commerce and this Office for the Trademark Registration Treaty. Under that Treaty it will be possible to treat all applicants, foreign and domestic, equally in regard to initial use requirements for filing an application for trademark registration in the United States Patent and Trademark Office.

Dated: June 16, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:
JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 78-18301; Filed 6-29-78; 8:45 am]

[973 TMOG 19 (Aug. 1, 1978)]

---

(98) **THE RETENTION SCHEDULE FOR TRADEMARK RECORDS**

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.

THE RETENTION SCHEDULE FOR TRADEMARK RECORDS—(Continued)

Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Index. Index to trademark registrations that are renewed.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
B. Serial Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings. Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.
Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from *Official Gazette.*	
a. Those which have been opposed.	Retain in agency until no longer needed for reference.
b. All others.	Destroy when mark is registered.
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	*PERMANENT.* Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.
b. Working papers and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark Practice and Procedure Files. Record set of training materials used in training trademark examiners.	*PERMANENT.* Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.
Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	
a. Records that supplement the International Property Activities Case Files (Item 103).	*PERMANENT.* Transfer to office responsible for international affairs after case is closed.
b. Other materials.	Destroy 5 years after close of case or sooner if no longer needed.

THE RETENTIAL SCHEDULE FOR TRADEMARK RECORDS—continued

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state: 1. That they be made of material suitable for being placed inside a manila file wrapper. 2. That they be capable of being arranged flat, such as being folded. 3. That they be of a size not to exceed 8½ inches wide by 13 inches long. (Rule 2.56) These requirements provide for specimens which will fit inside the application file wrapper, which is 9 x 14 inches in size and which will conveniently expand to about one inch thickness. Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

February 28, 1979.

[980 TMOG 16 (3-27-79)]

SAUL LEFKOWITZ,
Acting Assistant Commissioner for Trademarks.

---

(99) FLEXIBLE WORKING HOURS

On January 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

Dec. 13, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

---

(100) BULKY SPECIMENS IN TRADEMARK CASES

When an application containing bulky specimens is received, it will be given a filing date; but before it is forwarded to the Examiner, a letter will be sent to the applicant requiring new specimens in conformance with Rule 2.56. If the new specimens are not received within six months from the date of the letter, the application will be abandoned. The letter will also note that the "bulky specimens" received by the Office will be held for pick-up by the applicant for 30 days from the date of the letter, and will then be destroyed.

This practice is being instituted to alleviate the increased storage difficulties posed by bulky specimens. As always, however, an Examiner has the discretion to request additional information in the form of bulky specimens during examination under Trademark Rule 2.61(b). In the case of International Class 16, at least one complete issue of a publication will still be required. Also in the situation where the mark is a configuration of the goods, or a configuration of the container of the goods, then one actual container may be required. The other four specimens should be facsimiles as described in Trademark Rule 2.57. All applicants are reminded that bulky specimens which are not picked up within 30 days of notification will be destroyed and that specimens having intrinsic value should not be filed.

The inconsistent provisions of the previous O.G. Notice concerning bulky specimens [900 T.M.O.G. 176 (July 25, 1972], are hereby repealed.

The new procedure will be put into effect on April 1, 1979.

Feb. 28, 1979.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[980 TMOG 17 (3-27-79)]

---

(100) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Reestablishment

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of March 1974, and after consultation with GSA, it has been determined that the reestablishment of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in September, 1970, and its present charter expired on January 10, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five per cent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The

Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Association. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office, Washington, D.C. 20231; telephone (703) 557-3881.

Dated March 15, 1979.

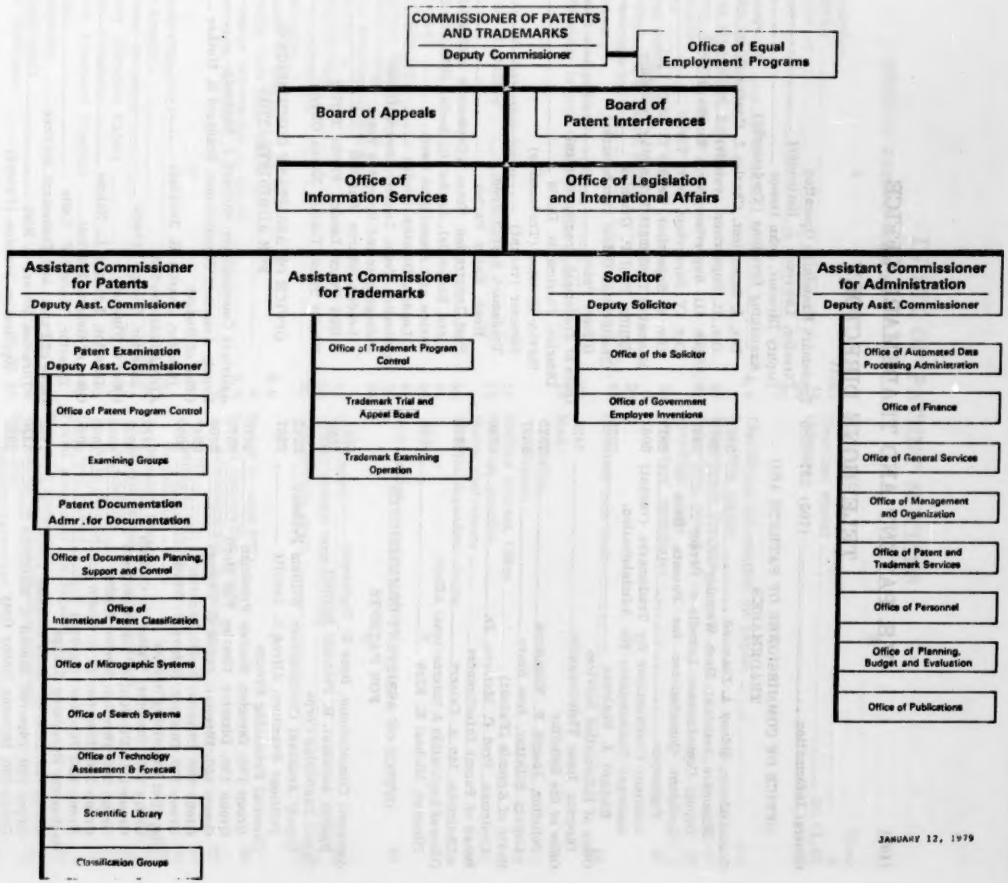
GUY W. CHAMBERLIN,
Assistant Secretary for Administration.

[FR Doc. 79-8929; Filed 3-22-79; 8:45 am]

[982 TMOG 14 (5-15-79)]

Attachment to DOO 30-3B

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office


COMMISSIONER OF PATENTS AND TRADEMARKS
Deputy Commissioner
Office of Equal Employment Programs
Board of Appeals
Board of Patent Interferences
Office of Information Services
Office of Legislation and International Affairs
Assistant Commissioner for Patents
Deputy Asst. Commissioner
Patent Examination Deputy Asst. Commissioner
Office of Patent Program Control
Examining Groups
Patent Documentation Admr. for Documentation
Office of Documentation Planning, Support and Control
Office of International Patent Classification
Office of Micrographic Systems
Office of Search Systems
Office of Technology Assessment & Forecast
Scientific Library
Classification Groups
Assistant Commissioner for Trademarks
Office of Trademark Program Control
Trademark Trial and Appeal Board
Trademark Examining Operation
Solicitor
Deputy Solicitor
Office of the Solicitor
Office of Government Employee Inventions
Assistant Commissioner for Administration
Deputy Asst. Commissioner
Office of Automated Data Processing Administration
Office of Finance
Office of General Services
Office of Management and Organization
Office of Patent and Trademark Services
Office of Personnel
Office of Planning, Budget and Evaluation
Office of Publications

JANUARY 12, 1979

U.S. PATENT AND TRADEMARK OFFICE

TELEPHONE DIRECTORY

General Information ---------- (703) 557–3080

OFFICE OF COMMISSIONER OF PATENTS AND TRADEMARKS

Commissioner, Sidney A. Diamond ---------- 3071
Executive Assistant, Herb Wamsley ---------- 3073
Deputy Commissioner, Lutrelle F. Parker ---------- 3961
Assistant Commissioner for Patents, Rene D. Tegtmeyer ---------- 3811
Assistant Commissioner for Trademarks (vacant) 3061
Assistant Commissioner for Administration, Richard J. Shakman ---------- 3055
Office of Information Services
Director, Isaac Fleischmann ---------- 3428
Office of the Solicitor
Solicitor, Joseph F. Nakamura ---------- 3525
Deputy Solicitor, Jere Sears ---------- 3527
Board of Appeals (Patent)
Chairman, Fred C. Mattern, Jr. ---------- 3380
Board of Patent Interferences
Chairman, Ian A. Calvert ---------- 3625
Office of Legislation & International Affairs
Director, Michael K. Kirk ---------- 3065

OFFICE OF ASSISTANT COMMISSIONER FOR PATENTS

Assistant Commissioner, Rene D. Tegtmeyer ---------- 3811
Special Assistant, R. Franklin Burnett ---------- 3054
Patent Examining Corps
Deputy Assistant Commissioner, William Feldman -- 2012
Petitions Examiner, Alfred L. Leavitt ---------- 3337
Chemical Examining Groups
Group 110, Director, Rueben Friedman ---------- 3610
Group 120, Director, Charles Van Horn ---------- 3575
Group 140, Director, James O. Thomas ---------- 3800
Group 160, Director, Samih Zaharna ---------- 3547
Group 170, Director, Robert F. White ---------- 3680
Electrical Examining Groups
Group 210, Director, Walter L. Carlson ---------- 2488
Group 220, Director, C. Don Quarforth ---------- 2877
Group 230, Director, Norton Ansher ---------- 5088
Group 240, Director, Al L. Smith ---------- 2900
Group 250, Director, (vacant) ---------- 2084
Mechanical Examining Groups
Group 310, Director, Mark Newman ---------- 2921
Group 320, Director, Samuel S. Matthews ---------- 3320
Group 330, Director, Bobby Gray ---------- 3330
Group 340, Director, Donley J. Stocking ---------- 3340
Group 350, Director, Gerald Forlenza ---------- 3000
Office of Patent Program Control
Director, William A. Smith III (Acting) ---------- 3955
Patent Documentation Organizations
Administrator, Alfred C. Marmor ---------- 3051

OFFICE OF ASSISTANT COMMISSIONER FOR TRADEMARKS

Assistant Commissioner (vacant) ---------- 3061
Trademark Trial and Appeal Board
Chairman, Saul Lefkowitz ---------- 3551
Trademark Examining Operation
Director, Lawrence J. Bettendorf ---------- 3268
Deputy Director, John Demos ---------- 3268
Examining Divisions (Trademarks)
Div. I, Supervisor, Charles J. Condro ---------- 3278
Div. II, Supervisor, (vacant) ---------- 3277
Div. III, Supervisor, Myra Kurzbard ---------- 9560
Div. IV, Supervisor, Betty Vertiz ---------- 9550
Div. V, Supervisor, Lenore D. Lady ---------- 5380
Manual of Trademark Examining Procedure
Editor, Paul P. Gralnick ---------- 5380
Classification Officer (Trademarks)
Gilbert Pence ---------- 5380
Office of Trademark Program Control
Director, Patricia M. Davis ---------- 3881
Service Division (Trademarks)
Director (vacant) ---------- 3331
Trademark Search Room
Head, Kathy Parish ---------- 3281
Post-Registration Team (Trademark Affidavits and Renewals), Leader, Catherine Hill ------ 2923
Review and Amendment Team
Leader, Dorothy Gordon ---------- 3325
Application Team, Leader, Edward Hayes ------- 3325
Stenographic and Reception Team
Leader, Sharon Furbush ---------- 9558
IKE Team, Leader, Portia Taylor ---------- 3325
Docket Team, Leader, Karen Oliver ---------- 3325

OFFICE OF ASSISTANT COMMISSIONER FOR ADMINISTRATION

Assistant Commissioner, Richard J. Shakman ---------- 3055
Deputy Assistant Commissioner, Bradford R. Huther -- 2290
Office of Budget
Director, Charles H. Jennings ---------- 7337
ADP Administration
Director, George Vaveris ---------- 3646
Office of Finance
Director, Leonard L. Nahme ---------- 3761
Office of General Services
Director, Vincent F. Tobin ---------- 3566
Office of Patent and Trademark Services
Director, Robert J. Rish ---------- 3236
Application Division (Patent)
Head, Clementine Griffen ---------- 3256
Assignment Division
Head, Saliye M. Hayden ---------- 3266
Patent Search Division
Head, Charles E. McMullan ---------- 2219
Office of Personnel
Personnel Officer, Aaron Deitch ----------2662
Office of Publications
Director, Stanley J. Bania ---------- 3794
Publishing Division
Acting Manager, Ruth C. Mason ---------- 3283

INDEX OF PATENT NOTICES

INDEX OF PATENT NOTICES

A

Items

Abandonments:
- Express — 43
- Notice of — 44

Abstracts — 60

Address:
- Change of — 8, 9
- Office Mailing — 1

Affidavits after Final Rejection — 47

Allowance, Reasons for — 50, 51, 61

Amendments:
- Fees — 25
- Hand delivery of — 5
- Preliminary, to cancel claims — 29

Appeal hearings — 50, 51, 65

Assignments:
- Issuance of patent to assignee — 20
- Uniformity in submitting assignee names — 21

C

Certificate of Correction forms — 16

Certificate of Mailing — 11

Claims:
- Copied from patents — 38
- Dependent — 64
- Informal — 29
- Markush-type — 41
- Multiple Dependent — 34

Commercial success — 63

Computer Program Applications:
- Practice re — 56
- Proposed rules — 55

Copies of applications — 32

Correspondence:
- Change of address — 8, 9
- Identify with Issue Batch No. — 4
- Necessary information on papers — 3, 4
- Post card receipts — 6

D

Dependent Claims — 64

Deposit accounts — 26–28

Depositions, Examiner — 73

Depository Libraries, Patent — 72

Directory, Telephone — 103

Disclosure Document Program — 69

Drawings:
- Acceptable — 13
- Requirements — 34

Duty of Disclosure — 50, 53, 54

E

Execution of applications — 35

Express abandonments — 43

Express mail — 10

Extensions of time — 47, 48, 68

F

Facsimiles of applications — 32

Fees — 25–29

Filing receipt — 23

Flexible working hours — 19.1

Foreign language:
- Applications — 31
- Oaths — 50
- References, translations of — 49

Fraud — 39, 53

G

GPO Subscription Service — 17, 18

Government Patent Policy:
- Statements under AEC and NASA Acts — 46

Graphical illustrations in specification — 33

Group numbers on papers — 2, 3

H

Items

Hand delivery of papers — 5

Hearings, appeal — 50, 51, 65

Holidays — 12

I

Identifying information on papers — 2–4

Inquiries, status — 7

Interference Practice — 66–68

Interviews, record of — 45

Invalidity study — 80.1

Inventors' certificates — 57

L

Looseleaf rule book — 19

M

Mail:
- Delays — 11
- Express — 10

Mailing address, Office — 1

Markush practice — 41

Metric equivalents — 30

Multiple dependent claims — 34

N

Non-English language applications — 31

O

Obviousness — 37, 63

Official Gazette subscriptions — 17, 18

Organization chart — 102

P

Passes to enter PTO — 24

Patent Cooperation Treaty:
- Administrative Instructions — 77
- Fees — 78
- Filing in Canada — 79
- Legislation — 75
- Member States — 77, 78
- Questions most frequently asked — 80
- Regulations — 77
- Rule changes — 76

Post card receipt — 6

Postal emergency contingency plan — 71

Powers of attorney:
- Change in plurality of applications — 9

Prior Art:
- Citation of — 42, 54
- Consideration of — 42, 50–52
- Statement — 50, 51

Priority:
- Based on application for Industrial Design — 58
- Based on Foreign application filed under a Bilateral or Multilateral Treaty — 59
- Based on Inventor's Certificates — 57

Protests — 50–52

Public Use Proceedings — 50, 51

R

Receipts, post card — 6

Reissues — 50, 52, 53

Rejections:
- New grounds after appeal brief — 62

Restriction and Election — 40, 41

Rule book, loose leaf — 19

Rule changes:
- Advisory opinions, deferral of proposal — 74
- Computer program listings, proposal — 55
- Drawing requirements — 34
- Miscellaneous examining and appeal — 50–52
- Multiple dependent claims — 34
- Patent Cooperation Treaty — 76

S

	Items
Search Facilities in PTO:	
Regulations	14
Violations	15
Searches, Recording of	42
Security procedure	24
Status inquiries	7
Subscriptions to Government publications	17, 18
Suspension of action	58, 70
Symbols in applications	36
Telephone directory	103
Testimony, examiner	78
Title of invention	22
Trademarks:	
Applications Under Section 44 (Withdrawal of Proposal)	97
Bulky Specimens in Trademark Cases	100
Conference of Parties in Inter Partes Proceedings	89
Dissemination of Trademark Information	94
Flexible Working Hours	99
Initial Processing of Applications	85
International Protection of Government Embossed Seals	90
Interviews Involving Application	81
Notice to Purchasers of Trademark Indices	95
Petition to Make Applications Special	86
Powers of Attorney in Registered Files	82
Preface to the Trademark O.G. Notices	83
Public Advisory Committee	101
Realignment of Handling Opposition Papers	88
Recording of "Territorial Assignments"	92
Request for Extension of Time to Oppose	84
Retention Schedule for Trademark Records	98
Rule 2.165 Requirements for Section 8	93
Trademark Registration Treaty	87
Trademark Registration Treaty, Implementing Legislation	96
Trademark Rules Practice Book	91
Translations of Foreign References	49

W

Working hours, PTO	19, 1

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
July 3, 1979. *Acting Commissioner of Patents and Trademarks.*

Examination

Pursuant to the provisions of 37 C.F.R. 1.341(c), an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys or agents will be held on Tuesday, April 8, 1980.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

37 C.F.R. 1.341(f) provides, in pertinent part, "Officers and employees of the United States who are disqualified by statute (18 U.S.C. 203, 205) from practicing as attorneys or agents in proceedings or other matters before Government departments or agencies, may not be registered, * * * but officers or employees whose official duties require the preparation and prosecution of applications for patent may be registered (on compliance with the regulations in this part) or recognized to practice, to the extent necessary to carry out their official duties." If you are an officer or employee of the United States, your application for registration *must* be accompanied by your supervisor's *verified statement* that your official duties as a United States officer or employee require that you prepare and prosecute applications for patent.

The examination will be given under the supervision of the Office of Personnel Management (formerly Civil Service Commission), and may be taken in any of the cities in which the Office of Personnel Management regularly conducts examinations. Applications to take the examination must be filed in the Patent and Trademark Office together with a $35 fee not later than January 31, 1980.

Application blanks may be obtained from the Clerk of the Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Dec. 10, 1979. *Chairman, Committee on Enrollment.*

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

LUTRELLE F. PARKER,
Nov. 27, 1979. *Acting Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,601, Re. S.N. 084,261, Filed Oct. 12, 1979, Cl. 74/339, TRANSMISSION WITH RESILIENTLY LOADED MAINSHAFT GEARS, Elmer A. Richards, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Howard C. Gordon, Ex. Gp.: 352

Re. 29,880, Re. S.N. 084,381, Filed Oct. 12, 1979, Cl. 422/64, APPARATUS FOR USE IN INVESTIGATING SPECIMENS, Ian David Duff, Owner of Record: *The Secretary of State for Social Services, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 173

D. 235,779, Re. S.N. 086,457, Filed Oct. 19, 1979, Cl. D26/13 C, PHASING SIMULATOR FOR A MUSICAL INSTRUMENT, Keith Barr, Owner of Record: *MXR Innovation Inc., Rochester, N.Y.,* Attorney or Agent: Philip K. Fitzsimmons, Ex. Gp.: 290

3,289,377, Re. S.N. 090,347, Filed Nov. 1, 1979, Cl. 052/656, INSULATED FRAME AND CONNECTOR THEREFOR, Frank W. Hetman, Owner of Record: *Alpana Aluminum Products, Inc., Minneapolis, Minn.,* Attorney or Agent: Jack W. Wicks, et al., Ex. Gp.: 354

3,704,510, Re. S.N. 084,139, Filed Oct. 12, 1979, Cl. 29/568, MACHINE TOOL WITH TOOL CHANGER, Robert K. Sedgwick, et al., Owner of Record: *Kearney & Trecker Corporation, West Allis, Wis.,* Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 324

3,738,608, Re. S.N. 086,619, Filed Oct. 19, 1979, Cl. 251/176, CHARGE FORMING METHOD AND APPARATUS WITH OVERSPEED GOVERNOR, Warren D. Nutten, et al., Owner of Record: *Borg-Warner Corporation, Chicago, Ill.,* Attorney or Agent: Robert L. Zieg, et al., Ex. Gp.: 341

3,770,735, Re. S.N. 085,695, Filed Oct. 17, 1979, Cl. 544/182, FERROIN REAGENT AND METHOD OF MAKING SAME, Lawrence L. Stookey, Owner of Record: *Hach Chemical Company, Ames, Iowa,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 121

3,836,331, Re. S.N. 085,500, Filed Oct. 17, 1979, Cl. 23/230 R, COLORIMETRIC DETERMINATION OF IRON, Lawrence L. Stookey, Owner of Record: *Hach Chemical Company, Ames, Iowa,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 173

3,921,021, Re. S.N. 085,930, Filed Oct. 18, 1979, Cl. 313/188, DISPLAY PANEL HAVING MEMORY, David Glaser, et al., Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

3,935,791, Re. S.N. 086,320, Filed Oct. 19, 1979, Cl. 91/517, HYDRAULIC DRIVE FOR THE DIE CLOSING UNIT OF AN INJECTION MOLDING MACHINE, Karl Hehl, Owner of Record: *Inventor, Lossburg, Germany,* Attorney or Agent: Arthur Schwartz, Ex. Gp.: 343

3,973,244, Re. S.N. 040,140, Filed May 18, 1979, Cl. 364/200, MICROCOMPUTER TERMINAL SYSTEM, Lawrence R. Lovercheck, et al., Owner of Record: *Zentec Corporation, Santa Clara, Calif.,* Attorney or Agent: Jack M. Wiseman, Ex. Gp.: 237

4,051,881, Re. S.N. 084,528, Filed Oct. 12, 1979, Cl. 144/288 A, CURING RIM, Harold S. Peterson, Owner of Record: *Applied Power Inc., Milwaukee, Wis.,* Attorney or Agent: Robert L. Lindgren, Ex. Gp.: 324

4,054,829, Re. S.N. 085,324, Filed Oct. 16, 1979, Cl. 323/6, ELECTRICAL ISOLATORS, Terence John Searle, Owner of Record: *Memory Devices Limited, East Molesey, England,* Attorney or Agent: Howard M. Bollinger, et al., Ex. Gp.: 212

4,054,901, Re. S.N. 082,783, Filed Oct. 9, 1979, Cl. 357/81, INDEX MOUNTING UNITARY HEAT SINK APPARATUS WITH APERTURED BASE, Steven F. Edwards, et al., Owner of Record: *Thermalloy Incorporated, Dallas, Tex.,* Attorney or Agent: Jack A. Kanz, Ex. Gp.: 254

4,055,766, Re. S.N. 085,070, Filed Oct. 15, 1979, Cl. 250/340, CONTROL SYSTEM FOR GAMMA CAMERA, Don W. Miller, et al., Owner of Record: *The Ohio State University, Columbus, Ohio,* Attorney or Agent: Sidney W. Milland, et al., Ex. Gp.: 256

4,056,872, Re. S.N. 084,481, Filed Oct. 15, 1979, Cl. 407/114, POSITIVE RAKE CUTTING INSERT FOR USE IN NEGATIVE RAKE HOLDERS, Heinz H. Seidel, Owner of Record: *GTE Sylvania Incorporated, Stamford, Conn.,* Attorney or Agent: Robert E. Walter, Ex. Gp.: 324

4,058,672, Re. S.N. 084,016, Filed Oct. 11, 1979, Cl. 178/4, PACKET-SWITCHED DATA COMMUNICATION SYSTEM, William C. Crager, et al., Owner of Record: *International Telephone and Telegraph Corp., Nutley, N.J.,* Attorney or Agent: Walter J. Baum, et al., Ex. Gp.: 234

4,070,710, Re. S.N. 082,592, Filed Oct. 9, 1979, Cl. 364/900, RASTER SCAN DISPLAY APPARATUS FOR DYNAMICALLY VIEWING IMAGE ELEMENTS STORED IN A RANDOM ACCESS MEMORY ARRAY, Josef S. Surkonick, et al., Owner of Record: *Nugraphics, Inc., Sunnyvale, Calif.,* Attorney or Agent: Robert Spensley, et al., Ex. Gp.: 237

4,074,757, Re. S.N. 085,071, Filed Oct. 15, 1979, Cl. 166/261, LIGNOSULFONATES FOR HIGH-TEMPERATURE PLUGGING, Betty J. Felber, et al., Owner of Record: *Standard Oil Company, Chicago, Ill.,* Attorney or Agent: Robert B. Stevenson, Ex. Gp.: 354

4,087,382, Re. S.N. 086,224, Filed Oct. 18, 1979, Cl. 252/455 R, CATALYST AND PROCESS FOR USING SAME, Sargis Khoobiar, Owner of Record: *Inventor,* Attorney or Agent: William C. Long, Ex. Gp.: 116

4,095,979, Re. S.N. 084,333, Filed Oct. 12, 1979, Cl. 96/1.4, METHOD AND APPARATUS FOR PRODUCING DUPLEX COPIES, Charles T. Hage, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Paul R. Holmes, et al., Ex. Gp.: 166

4,109,903, Re. S.N. 053,864, Filed Jul. 2, 1979, Cl. 271/3, FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION, Klaus K. Stange, et al., Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 313

4,113,729, Re. S.N. 085,072, Filed Oct. 15, 1979, Cl. 546/74, 3-PHENOXYMORPHINANAS AND DERIVATIVES THEREOF, Ernest Mohacsi, Owner of Record: *Hoffmann-La Roche Inc., Nutley, N.J.,* Attorney or Agent: Jon S. Saxe, et al., Ex. Gp.: 122

4,116,669, Re. S.N. 075,917, Filed Oct. 17, 1979, Cl. 71/88, HERBICIDAL TETRAHYDROFURAN DERIVATIVES, Michael D. Barker, et al., Owner of Record: *Inventors,* Attorney or Agent: Nancy Joyce Gracey, Ex. Gp.: 122

4,120,533, Re. S.N. 084,167, Filed Oct. 12, 1979, Cl. 297/451, CANTILEVERED SUPPORTING SHELL FOR SEAT, Arthur J. Harder, Jr., Owner of Record: *Coach and Car Equipment Corporation, El Grove Village, Ill.,* Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 355

4,121,476, Re. S.N. 085,185, Filed Oct. 15, 1979, Cl. 74/411, FLEXIBLE DRIVE, James T. Hammond, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ernest A. Wegner, Ex. Gp.: 352

4,129,938, Re. S.N. 076,414, Filed Sep. 17, 1979, Cl. 29/605, METHOD OF MAKING TUBULAR COILS WITH COOLING AND INSULATING CHANNELS, Hariolf Hagenbucher, Owner of Record: *Inventor,* Attorney or Agent: Oliver D. Olson, Ex. Gp.: 321

4,136,201, Re. S.N. 085,069, Filed Oct. 15, 1979, Cl. 426/36, MICROBIAL RENNIN, Louis Feldman, Owner of Record: *Inventor,* Attorney or Agent: Nelson Littell Jr., et al., Ex. Gp.: 172

4,153,406, Re. S.N. 083,037, Filed Oct. 9, 1979, Cl. 425/438, STRIPPER RING FOR A CAPSULE-MAKING MACHINE, Larry Eugene Dittmann, et al., Owner of Record: *AMP Incorporated, Harrisburg, Pa.,* Attorney or Agent: William J. Keating, Ex. Gp.: 147

4,158,272, Re. S.N. 086,685, Filed Oct. 19, 1979, Cl. 49/431, VEHICLE WINDOW WITH NON-REMOVABLE SASH IN CURVED FRAME, Harry M. Riegelman, Owner of Record: *Rusco Industries, Inc., Fullerton, Calif.,* Attorney or Agent: Perry E. Turner, Ex. Gp.: 352

4,162,836, Re. S.N. 085,499, Filed Oct. 17, 1979, Cl. 354/139, ELECTRONIC FLASH INHIBIT ARRANGEMENT, George C. Harrison, Owner of Record: *Polaroid Corporation, Cambridge, Mass.,* Attorney or Agent: Edward S. Roman, Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Jan. 1, 1980

3,898,081	4,153,516	4,160,261	4,165,984
3,927,701	4,153,569	4,160,335	4,165,985
4,028,803	4,154,829	4,160,520	4,166,133
4,078,718	4,154,874	4,160,674	4,166,567
4,084,615	4,155,048	4,161,092	4,167,450
4,091,034	4,155,872	4,161,361	4,167,676
4,097,556	4,156,166	4,161,477	4,167,958
4,106,856	4,156,247	4,161,519	4,169,179
4,107,310	4,157,576	4,162,143	4,169,298
4,120,899	4,158,257	4,162,333	4,169,574
4,129,287	4,158,744	4,162,591	4,169,863
4,129,933	4,159,102	4,163,008	4,169,936
4,145,767	4,159,222	4,163,361	4,170,153
4,147,044	4,159,388	4,164,580	4,170,246
4,147,705	4,159,492	4,165,256	4,170,369
4,150,521	4,159,584	4,165,439	4,170,564
4,151,192	4,159,783	4,165,449	4,170,632
4,151,301	4,159,993	4,165,928	4,170,641
4,152,316	4,160,050	4,165,929	4,170,702
			4,171,201

Disclaimer

3,905,398.—*Hans A. Johansen* and *Larry R. Phillippi*, Mantua, Ohio. COMPOSITE REINFORCED HOSE WHEREIN THE REINFORCING MATERIAL IS BRAIDED AROMATIC POLYAMIDE FILAMENTS. Patent dated Sept. 16, 1975. Disclaimer filed June 20, 1977, by the assignee, *Samuel Moore and Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 6, 9, 11, 12, 13 and 14 of said patent.

Patents Available for Licensing or Sale

D. 252,839. ROCKING CHAIR. Ruben G. Ortiz, P.O. Box 567, Brentwood, Calif. 94513.

The following two patents are offered by the American National Bank of Denver, Trust Division, Attention: Frank Plunkett, P.O. Box 660, Denver, Colo. 80201.

3,853,990. INFECTIOUS KERATING BACTERIN AND ANTISERUM AND METHOD OF PREPARING SAME.

803,951. A METHOD OF PROTECTING THE SKIN FROM ULTRA-VIOLET RADIATION WITH TITANIC ACID AND ESTERS OF TITANIC ACID.

4,171,754. SCENTING OR PERFUMING LAMP. Ruperto L. Rosado, 2644 Beaumont St. Space 31–A, Sacramento, Calif. 95815.

3,804,156. AIR DISTRIBUTING AND CONTROL SYSTEM. George A. McDonough, 430 Wrightwood Ave., Elmhurst, Ill. 60126.

4,037,825. LOOP REACTOR FOR CHEMICAL PROCESSES. Herwig Burgert, c/o Gilbert L. Wells, Esq., 727 South 23rd St., Arlington, Va. 22202.

3,993,730. PUREFICATION OF COKE OVEN GAS WITH PRODUCTION OF SULFURIC ACID AND AMMONIUM SULFATE. Franklin D. Cooper, 1200 N. Queen St., Arlington, Va. 22209.

4,019,797. SYSTEM INCLUDING HOUSEHOLD CONNECTOR PLUG FOR SPLIT WIRE RECEPTACLE. Henry W. Prami, 275 South St., Murray Hill, N.J. 07974.

4,155,208. BUILDING INSULATION AND METHOD OF INSTALLATION. John A. Shanabarger, 273 East Maple St., Wabash, Ind. 46992.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Bldg. #500, Room 218, Schenectady, N.Y. 12345.

4,158,526. TURBINE ASSEMBLY INCLUDING A ROTATABLE LIQUID COLLECTION RING.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,169,659. MULTIPLE STANDARD TELEVISION SYNC GENERATOR.

4,169,746. METHOD FOR MAKING SILICON ON SAPPHIRE TRANSISTOR UTILIZING PREDEPOSITION OF LEADS.

4,169,807. NOVEL SOLVENT DRYING AGENT.

4,169,988. RASTER DISTORTION CORRECTION CIRCUIT.

4,170,024. TELEVISION CONTROL SYSTEM.

4,170,501. METHOD OF MAKING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE UTILIZING SIMULTANEOUS OUTDIFFUSION AND AUTODOPING DURING EPITAXIAL DEPOSITION.

4,170,616. METHOD OF FABRICATION OF A FRESNEL LENS.

4,170,778. FREQUENCY-SCANNED ANTENNA.

4,170,811. METHOD FOR COATING CATHODE MATERIAL ON CATHODE SUBSTRATE.

4,172,239. SIGNAL ATTENUATOR.

4,172,999. SELF-BIASING AMPLIFIER STAGE.

4,173,022. INTEGRATED GATE FIELD EFFECT TRANSISTORS HAVING CLOSED GATE STRUCTURE WITH CONTROLLED AVALANCHE CHARACTERISTICS.

4,173,023. BURST GATE CIRCUIT.

Simon Battery & Research Corporation offers to sell or grant licenses under the patents listed below. Inquiries respecting the purchasing or licensing of Simon Battery & Research patents should be addressed to: Simon Bastacky, President, Simon Battery & Research Corporation, 3040 Bigelow Blvd., Pittsburgh, Pa. 15219.

3,711,332. LEAD GEL STORAGE BATTERY (Available only for licensing).

3,755,102. PROCESS FOR TREATING INDUSTRIAL WASTES.

3,813,321. PROCESS FOR TREATING INDUSTRIAL WASTES.

Application for license may be addressed to the Group Patent Counsel, Major Appliance General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,889,988. PLASTIC ORIFICE INLET EXTENSION MEANS.

3,903,927. LIQUID FLOW DIVERSION ARRANGEMENT.

4,020,644. WATER DELIVERY SYSTEM AND METHOD FOR FORMING SAME.

4,145,748. SELF-OPTIMIZING TOUCH PAD SENSOR CIRCUIT.

4,156,152. CHARGE TRANSFER CIRCUIT WITH LEAKAGE CURRENT COMPENSATING MEANS.

4,156,233. CHARGE TRANSFER CIRCUIT WITH LEAKAGE CURRENT COMPENSATING MEANS.

4,158,216. CAPACITIVE TOUCH CONTROL.

4,158,804. MOSFET REFERENCE VOLTAGE CIRCUIT.

4,161,766. LAMINATED CAPACITIVE TOUCH-PAD.

4,162,566. METHOD AND COUPLING FOR SEVERING AND REJOINING SEALED TUBING.

4,162,571. METHOD OF CONSTRUCTING REFRIGERATOR CABINET.

4,165,105. CABINET TRANSITION SLEEVER.

4,165,478. REFERENCE VOLTAGE SOURCE WITH TEMPERATURE-STABLE MOSFET AMPLIFIER.

4,170,391. REFRIGERATOR CABINET CONSTRUCTION.

4,171,533. LOW VOLTAGE PROTECTION CIRCUIT FOR INDUCTION MOTORS.

The Gillette Company is prepared to grant non-exclusive licenses under the following U.S. patents and foreign counterparts on reasonable terms and conditions.

3,831,273. ELECTRIC SHAVERS.

3,863,338. ELECTRIC SHAVER WITH CUTTERS MOUNTED IN END TO END ALIGNMENT.

3,872,587. ELECTRIC SHAVER WITH LONGITUDINALLY SPLIT CUTTER.

3,996,546. PLUG FOR VOLTAGE ADAPTATION.

4,012,837. DRY SHAVERS.

4,013,330. DUAL-STANDARD ELECTRIC PLUG.

4,092,581. RECHARGEABLE BATTERY-OPERATED SHAVER WITH PRINTED CIRCUIT MODULE MOUNTING BRUSH MEANS, BATTERIES AND SWITCH MEANS.

4,105,493. PRODUCTION OF SHAVING FOIL.

4,114,264. CLIPPER MECHANISM.

4,115,920. DRY SHAVER WITH PRIMARY AND SECONDARY MODES OF OSCILLATION.

4,133,104. DRY SHAVERS.

4,134,202. DRY SHAVER FOIL HEADS.

4,138,811. SHAVING FOIL.

4,144,429. MANUALLY OPERATED ELECTRICAL SWITCH.

4,144,640. HAIR CLIPPERS.

4,160,177. VIBRATORY ELECTROMAGNETIC MOTOR.

Inquiries should be addressed to Patent Counsel, The Gillette Company, Prudential Tower Building, 37th Floor, Boston, Mass. 02199.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave. Philadelphia, Pa. 19142.

4,047,219. RADIATION SENSITIVE THYRISTOR STRUCTURE WITH ISOLATED DETECTOR.

4,053,922. LIGHT TRIGGERED THYRISTOR HAVING CONTROLLED TURN ON DELAY.

The following patents are available for licensing at a reasonable royalty rate. Please direct all correspondence to: Patent Counsel, Texasgulf, Inc., High Ridge Park, Stamford, Conn. 06904.

3,191,783. GRANULAR PRODUCT STORAGE.

3,199,955. PROCESS OF REDUCING SULFUR DIOXIDE TO ELEMENTAL SULFUR.

3,332,744. RADIOMETRIC METHOD FOR PLANT STEAM CONTROL IN POTASH AND PHOSPHATE RECOVERY PROCESS.

3,427,145. METHOD OF AGGLOMERATING POTASSIUM CHLORIDE USING HYDROFLUORIC ACID OR METALLIC FLUORIDE.

3,442,553. SLURRY MINING OF CORNALLITE.

3,455,647. PROCESS FOR PRODUCING SODIUM SESQUICARBONATE AND SODA ASH FROM TRONA.

3,512,941. APPARATUS FOR PRODUCING NORMAL SULFURPHOSPHATE.

3,537,589. OUTSIDE DRIVE FOR A TILTING PAN FILTER

3,595,624. METHOD AND APPARATUS FOR WASHING CRYSTALLIZERS.

3,655,538. PROCESS FOR ELECTROWINNING ZINC FROM SULFIDE CONCENTRATES.

3,674,442. CONTROL OF ORGANIC DEPOSITION IN SLURRY HEATERS IN POTASH CRYSTALLIZER CIRCUIT.

3,807,141. APPARATUS FOR REDUCING THE HYDROGEN SULPHIDE AND HYDROGEN POLYSULFIDE CONTENT OF LIQUID SULFUR.

3,810,542. PROCESS FOR REMOVING CHROMIUM FROM COOLING TOWER BLOWDOWN STREAMS.

3,920,424. LIQUID SULFUR GAS SCRUBBER APPARATUS.

3,989,607. SOLVENT EXTRACTION AND ELECTROWINNING OF ZINC AND COPPER FROM SULFATE SOLUTION.

4,049,514. ZINC HYDROMETALLURGICAL PROCESS.

4,063,933. PROCESS FOR THE TREATMENT OF COMPLEX LEAD-ZINC CONCENTRATES.

4,083,934. PROCESS FOR OBTAINING PURE ORTHOPHOSPHORIC ACID FROM SUPERPHOSPHORIC ACID.

4,158,043. PROCESS FOR PRODUCING SODA ASH FROM NATURAL ALKALI METAL CARBONATE-CONTAINING ORES.

Applications for licenses may be addressed to the General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind. 46804.

3,887,854. MULTI-SPEED MOTOR.

4,008,449. ELECTRICAL CONTROL DEVICE AND METHODS OF ADJUSTING AND OPERATING.

4,010,337. TOGGLE DEVICE.

4,020,358. DEVICE SYSTEM AND METHOD FOR CONTROLLING THE SUPPLY OF POWER TO AN ELECTRICAL LOAD.

4,030,802. TERMINAL BLOCK ASSEMBLY AND MULTIPLE CONNECTOR ASSEMBLY THEREFOR.

4,151,436. ELECTRICAL INSULATOR FOR SLOTTED MAGNETIC CORES.

4,160,316. APPARATTS FOR POSITIONING INSULATING MEMBERS IN MAGNETIC CORE SLOTS.

4,160,885. ELECTRICAL SWITCH AND METHOD OF OPERATION.

4,161,812. METHODS OF SECURING TORSIONALLY FLEXIBLE MOTOR MOUNTING ARRANGEMENTS TO SUPPORTS THEREFOR.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 17, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-22-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-19-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-29-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 1, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T990,001

LIGHT-SENSITIVE VESICULAR IMAGING MATERIALS

Roy F. Huffey, Ipswich; David E. Lothian, Colchester; Stuart C. Rennison, Hadleigh, and Michael K. Titman, Colchester, all of England, assignors to Bedford Limited, London, England

Continuation of Ser. No. 922,162, Jul. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 843,931, Oct. 18, 1977, abandoned. This application May 9, 1979, Ser. No. 37,513

Claims priority, application United Kingdom, Jul. 7, 1977, 28531/77

Int. Cl.[2] G03C *1/80, 1/54*

U.S. Cl. 430—162

1 Sheets Drawing. 17 Pages Specification

Light-sensitive vesicular imaging materials, suitable for the production of colored labels, etc., comprise a light-sensitive vesicular imaging layer applied to one surface of a transparent self-supporting plastics sheet or film such as a linear polyester, e.g. polyethylene terephthalate film, said light-sensitive vesicular imaging layer comprising a polymeric vehicle having uniformly dispersed therein a sensitizing agent which releases a vesicle-forming gas, preferably nitrogen, upon exposure to light and optionally including a pigment or dye, said polymeric vehicle comprising a thermoplastic polymer having a nitrogen permeability constant in the range 1×10^{-15} to 1×10^{-10} and being softenable upon heating above ambient temperature to permit the gas released by the sensitizing agent in the light-struck areas to form an image in the form of light-scattering or reflecting vesicles therein, wherein at least one pigmented or dyed coating layer which includes a polymeric binder and has an opacity represented by a total luminous transmittance measured by ASTM test method D-1003-61 not exceeding 25% is applied over the vesicular imaging layer and remote from the plastics sheet or film and provides a contrasting background for the image. The pigmented or dyed layer may optionally contain a self-adhesive or pressure-sensitive adhesive for affixing the material to a receptive substrate. Alternatively a separate self-adhesive or pressure-sensitive adhesive layer may be applied to the pigmented or dyed layer, optionally protected by a peelable backing layer.

T990,002

ACTUATOR FOR DISPENSING APPARATUS

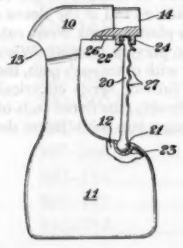
P. Richard Stoesser, 1201 Evamar Dr., Midland, Mich. 48640

Filed Jun. 11, 1979, Ser. No. 47,405

Int. Cl.[2] B05B *9/043*

U.S. Cl. 222—323

1 Sheets Drawing. 6 Pages Specification



An improved actuator for a liquid-dispensing apparatus of the type including a container for receiving liquids and a manually operated dispensing pump detachably connected to a container. The actuator comprises a rigid member having a lower end pivotally connected to the container but not integrally formed therewith and an upper end pivotally connected to the piston mechanism of the dispensing pump. The actuator is adapted to be operated by all the fingers of the hand holding the apparatus, thereby reducing user fatique.

T990,003

DISPENSER

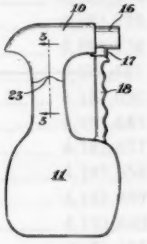
George A. Sweeney, 404 Rollcrest Ct., Midland, Mich. 48640

Filed Jun. 11, 1979, Ser. No. 47,406

Int. Cl.[2] B05B *9/043*

U.S. Cl. 222—383

1 Sheets Drawing. 11 Pages Specification



A manually operated dispensing pump is connected to a container by a suitable friction or snap-fit mechanism which includes self-orienting camming surfaces that cooperate to disconnect the pump from the container upon rotation of one relative to the other.

T990,004

FLUORINATED 1-HYDROXY-2-NAPHTHAMIDE COUPLER, COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Jose M. Fernandez; Robert G. Cameron, and Edward J. Walsh, all c/o Kodak Park Division, Rochester, N.Y. 14650

Division of Ser. No. 928,756, Jul. 27, 1978. This application May 4, 1979, Ser. No. 36,261

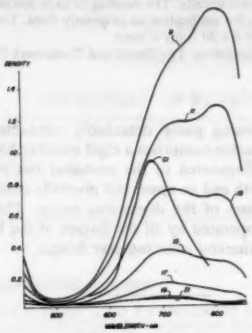
Int. Cl.[2] C07C *103/75*

U.S. Cl. 260—559 R

1 Sheets Drawing. 32 Pages Specification

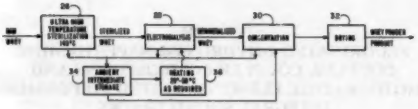
5,6,7,8 Tetrafluoro 1-hydroxy-2-naphthamide couplers which are N-substituted with a lower alkylphenoxybutyl ballasting group are disclosed as well as compositions and photographic elements containing these couplers in coupler solvent particles. The coupler solvent particles are comprised of a combination of a coupler solvent and the coupler capable of permitting the formation of a microcrystalline dye. Surprisingly these microcrystalline dyes exhibit a broadened absorption characteristic

in the 750 to 850 nm region of the spectrum. Dye images having such absorption characteristics are particularly suited



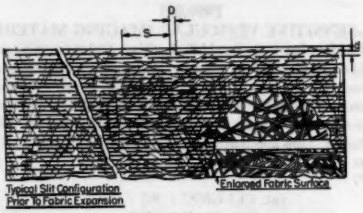
to forming integral infrared absorbing sound tracks in photographic elements, such as motion picture projection films.

T990,005
PROCESS FOR THE ELECTRODIALYSIS TREATMENT OF WHEY
William B. Iaconelli, 32 10th Ave., Scituate, Mass. 02066
Filed Nov. 22, 1978, Ser. No. 963,079
Int. Cl.[2] A21D *6/00*
U.S. Cl. 426—239
1 Sheets Drawing. 8 Pages Specification



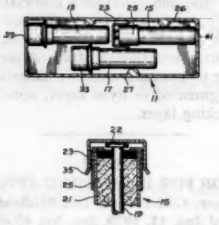
An improved process for the electrodialysis treatment of liquid whey is disclosed in which the raw whey is first subjected to an ultra high temperature environment of about between 130° C. to 150° C. for a period of approximately two seconds to sterilize the whey. The sterilized whey is then subjected to cooling and then to electrodialysis to effect a substantial reduction in ash content.

T990,006
NON-WOVEN NETS
James A. Williams, P.O. Box 67, Van Wyck, S.C. 29744
Continuation of Ser. No. 915,436, Jun. 14, 1978, abandoned.
This application Apr. 23, 1979, Ser. No. 32,085
Int. Cl.[2] B32B *3/10*
U.S. Cl. 428—131
1 Sheets Drawing. 8 Pages Specification



A net which comprises an expanded area-bonded non-woven fabric, and method of preparation. The net has a mesh perimeter in the range ¼ to 12 inches, tear strength of from 5 to 20 lb. per inch per lb. per square yard of net. The process comprises forming numerous, discontinuous parallel and overlapping slits, having lengths from 1/16 to 6 inches in area-bonded non-woven fabric, and then stretching the slit fabric in a direction transverse to the slits to form a net, and preferably heat treating the net.

T990,007
ELECTROCHEMICAL CELL AND BATTERY
Gurdip S. Sethi, 1669 Lake Ave., Rochester, N.Y. 14650
Filed Jun. 11, 1979, Ser. No. 47,398
Int. Cl.[2] H01M *2/24*
U.S. Cl. 429—158
1 Sheets Drawing. 7 Pages Specification



An electrochemical cell, including a current-collecting rod of one polarity received within a cylindrical current-collecting sleeve of opposite polarity, is provided with a conductive flared end cap welded to one end of the rod and extending concentrically around one end of the sleeve a band of insulating material, such as plastic shrink wrap, extends between the cap and the sleeve to prevent shorting. When assembled in an appropriate housing with other such cells, the end caps engage adjacent sleeves to provide series electrical connections between the cells. Preferably, the flared ends of the caps include a sharp edge that gouges into the adjacent sleeve to reduce the contact resistance.

PATENTS

GRANTED JAN. 1, 1980

ERRATA

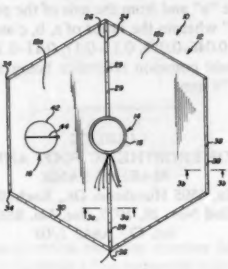
For CLASS	See PATENT NO.
433–173	4,180,910
433–009	4,180,911
433–013	4,180,912
433–228	4,180,913
072–217	4,180,997
409–088	4,181,063
166–361	4,181,196
280–011.2	4,181,227
430–067	4,181,526
430–543	4,181,527
428–474	4,181,528
430–626	4,181,529
430–620	4,181,530
430–270	4,181,531
435–117	4,181,573
435–077	4,181,574
435–011	4,181,575
435–247	4,181,576
260–042.48	4,181,581
430–114	4,181,620
264–045.9	4,181,647
424–256	4,181,657
424–266	4,181,658
424–271	4,181,659
548–110	4,181,660
548–195	4,181,661
549–060	4,181,664
585–025	4,181,684
525–402	4,181,685
525–474	4,181,686
525–100	4,181,687
525–390	4,181,688
525–419	4,181,689
428–040	4,181,711
426–272	4,181,739
430–414	4,181,750
430–314	4,181,755
430–058	4,181,772
526–143	4,181,790
179–001 SE	4,181,813
250–505	4,181,839
290–040 R	4,181,840
307–030	4,181,841
307–066	4,181,842
307–116	4,181,843
307–157	4,181,844
310–314	4,181,864

PATENTS

GRANTED JANUARY 1, 1980

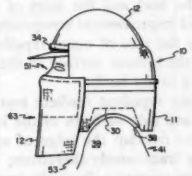
GENERAL AND MECHANICAL

4,180,867
SPACE ENCLOSING MEMBER
Marcus L. Ridgeway, Jr., Rte. 1, Box 159, Troy, Tex. 76579
Filed Feb. 27, 1978, Ser. No. 881,758
Int. Cl.[2] A41D *15/04;* E04B *1/347*
U.S. Cl. 2—89 **16 Claims**



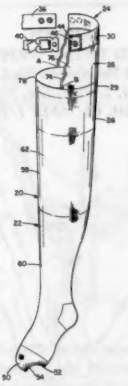
1. A multipurpose member of sheet material comprising:
a hexagonal shaped body portion having a centrally positioned opening;
a tubular portion attached to said body portion, said tubular portion being of a diameter equal to the diameter of said central opening in said body portion, said tubular portion having one end attached to said body portion along the edge of said circular opening; and
means are provided on said tubular portion spaced from the ends thereof for gathering said tubular portion, said gathering means being positioned on said tubular portion a distance Y from the edge of said central opening wherein Y is equal to the radius of said central opening.

4,180,868
ALL-WEATHER HAT ACCESSORY
Charles C. Snow, 4312 S. 4000 West, Granger, Utah 84120
Filed Nov. 15, 1977, Ser. No. 851,785
Int. Cl.[2] A41B *3/16;* A42B *1/18*
U.S. Cl. 2—203 **16 Claims**



1. A hat accessory comprising:
an outer material layer sized in length to extend from above the rim of a hat to below the collar area of a user and sized in width to extend around the rim of said hat rearward between about the temples of the user;
first securing means adapted to said outer layer to removably attach said hat accessory to a hat, said first securing means being an elastic-like band adapted to the upper edge of said accessory and being sized in length to tensionally surround said hat at about the rim thereof;
an inner material layer secured to said outer layer along the edges of said outer layer and to said outer layer between the upper and lower edges thereof to form a pocket sized in length from about the upper edge of said outer layer to about the collar area of a user when said accessory is attached to said hat and in width about the width of said outer layer;
an insert sized in length and width about the length and width of said pocket to fit therewithin, said insert being formed of a pliable liquid absorbent material; and
a face piece comprising:
a face piece outer material layer sized in length to extend from about the bridge of the nose of the user to the upper chest area of the user and in width to extend frontward about the face of the user between about the ears of the user,
third securing means adapted to said face piece outer layer to removably hold said face piece over the face of said user,
a face piece inner material layer secured to said face piece outer layer along the edges of said face piece outer layer and to said face piece outer layer between the upper and lower edges thereof to form a second pocket sized in length from about the upper edge of said face piece to about the throat area of the user and in width about the width of said face piece, and
a face piece insert sized in length and width about the length and width of said second pocket to fit therewithin, said insert being formed of a pliable liquid absorbent material.

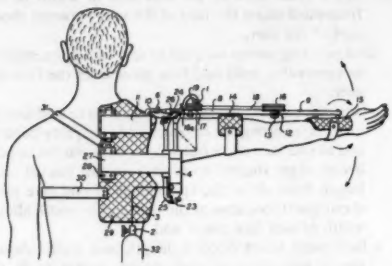
4,180,869
STOCKINGS
John E. Pedergrass, Seneca, S.C., and Cynthia A. Wichman, St. Charles, Ill., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jul. 1, 1977, Ser. No. 812,057
Int. Cl.[2] A61F *13/08;* A41B *11/04*
U.S. Cl. 2—240 **10 Claims**



1. In a full length therapeutic stocking of the type including a boot portion including elastomeric yarn, waist support means spaced above the boot portion, and a hip panel extending between the boot portion and the waist support means, that improvement including a pair of stocking supports extending between and attached to said waist support means and said boot portion, each of said supports comprising a strip of fabric extending from a respective point at said waist support means to and terminating at a respective point at the upper edge of said boot portion, and each of said respective points of one of said supports being spaced circumferentially of said stocking

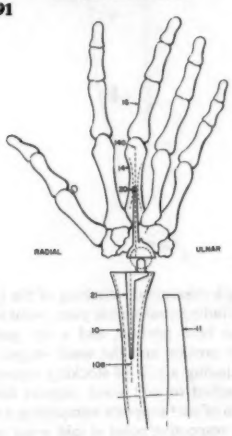
from the corresponding respective point of the other of the supports.

4,180,870
UNIVERSAL-ORTHESE
Radoje Radulović, Ilidza-Sarajewo; Mustafa Karisik, Sarajewo, both of Yugoslavia, and Klaus R. Wolfer, Stuttgart, Fed. Rep. of Germany, assignors to Fa Wilh. Jul. Teufel, Stuttgart, Fed. Rep. of Germany
Filed Apr. 14, 1976, Ser. No. 676,879
Claims priority, application Yugoslavia, Apr. 15, 1975, 948/75
Int. Cl.² A61F *1/00*
U.S. Cl. 3—1.2 **12 Claims**



1. An orthesis for supporting an arm of a patient whose functional capacity has been diminished comprising an articulated support system adapted to be attached to the trunk and arm of the patient, said support system comprising a fulcrum joint simulating the shoulder joint of the patient and a lever system extending along the arm of the patient, means for applying a force corresponding substantially to the weight of the arm of the patient at a point on said extending lever system substantially lying on a line connecting the fulcrum joint and the center of gravity of the arm of the patient irrespective of the position of the arm of the patient.

4,180,871
PRE-CENTERED TOTAL WRIST PROSTHESIS
Robert S. Hamas, 2808 Beechwood Blvd., Pittsburgh, Pa. 15217
Filed Nov. 2, 1977, Ser. No. 847,841
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **7 Claims**



1. A total wrist prosthesis comprising a distal extension having a longitudinal axis identifiable from the profile thereof for being aligned with the longitudinal axis of the third metacarpal when the said distal extension is fixed to one or more metacarpals, a proximal extension having a longitudinal axis identifiable from the profile thereof for being aligned with the longitudinal axis of the distal radius and means for joining the distal and proximal extensions for biaxial or triaxial movement, the axis for flexion-extension motion volarly offset from the axis of the distal extension a distance "b" and from the axis of the proximal extension a distance "d," the axis for radial-ulnar deviation being ulnarly offset from the axis of the distal extension a distance "a" and from the axis of the proximal extension a distance "c," wherein the ratios of a, b, c and d to a common reference are 0.046–0.058, 0.13–0.17, 0.11–0.13, and 0.08–0.11, respectively said common reference being a length between about 51 and 74 mm.

4,180,872
WATERPROOF PROSTHETIC FOOT AND METHOD OF MAKING SAME
Neal S. Chaikin, 4505 Hornbeam Dr., Rockville, Md. 20853
Filed Nov. 28, 1977, Ser. No. 855,370
Int. Cl.² A61F *1/08*
U.S. Cl. 3—7 **6 Claims**

1. An improvement for waterproofing a prosthetic foot formed of a keel adapted to be coupled with a lower end of an artificial leg and a foot body surrounding the keel and having an upper portion and a lower portion defining a toe, a heel and a bottom surface extending from said toe to said heel and front, rear and side surfaces extending upward to the upper portion from the toe, the heel and the sides of the bottom surface, respectively, said improvement comprising

a substantially flat sole of water repellent resilient material secured to the bottom surface of the foot and extending from the toe to the heel;

a band of water repellent resilient material secured to the front, rear and side surfaces of the lower portion of the foot body to overlap the edge of said sole and extend substantially transversely therefrom;

water repellent cement adhesively securing said sole and said band to said foot body; and

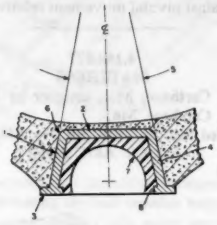
a coating of water repellent material covering the top portion of the foot body and the interface of the edges of said band of water repellent resilient material with the foot body whereby the prosthetic foot can be immersed in water while water is prevented from reaching the keel.

4,180,873
IMPLANTED ACETABULAR PROSTHESIS
Irving E. Fixel, 111 N. 31 Ave., Hollywood, Fla. 33021
Filed Dec. 6, 1976, Ser. No. 748,233
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.912 **3 Claims**

1. A prosthetic device for repair or replacement of joints of

skeletal bones by implantation in skeletal bone, said prosthetic device comprising

a hollow cup member having a small end and a large end, said cup having substantially smooth inner and outer surfaces, said outer surface having a frustro-conical shape and a size which is adapted to effectuate a force fit relationship with a matching frustro-conically shaped void in skeletal bone,



a liner positioned within said cup member having an inner surface approximating a hemispherical void and a substantially smooth outer surface, said outer surface being in contact with said inner surface of said cup,

means attached to said cup adapted to prevent said cup from further penetration into the void in the skeletal bone comprising a flange attached to said large end of said cup extending radially outward of said outer surface of said cup and a substantially flat cover attached to said small end of said cup.

4,180,874

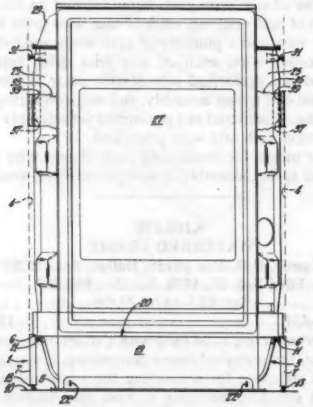
BATHTUB ASSEMBLY

Merritt W. Seymour, Sylvania, and James E. Jones, Toledo, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 618,714, Oct. 1, 1975, abandoned. This application Mar. 13, 1978, Ser. No. 885,934

Int. Cl.[2] A47K *3/00, 3/08*

U.S. Cl. 4—173 M **3 Claims**



1. A bathtub assembly adapted to be positioned between two opposed sidewalls and a third wall between said sidewalls of a room comprising:

a bathtub having a support section having a notch therein at each end of said bathtub and at least one pad formed at each end of said bathtub adapted to receive an after-defined first horizontally adjustable securement means positioned below said notches;

a pair of framing members adapted to be individually secured to one of said opposed walls of the room, each of said framing members having a support surface adapted to engage one of said notches in said support section, each of said framing members having a pair of legs containing a vertically adjustable support means at the foot of each leg, each leg further having first horizontally adjustable securement means at the end of each leg opposite the foot to contact said pad;

a first end wall adapted to contact said tub at one end and extending upwardly therefrom and having a second horizontally adjustable securement means located at the end of the first end wall opposite the end adapted to contact said bathtub, said second horizontally adjustable securement means being adapted to contact one of the opposed walls of the room;

a second end wall adapted to contact said tub at one end and extending upwardly therefrom and having a third horizontally adjustable securement means located at the end of the second end wall opposite the end adapted to contact said bathtub, said third horizontally adjustable securement means being adapted to contact the other opposed wall of the room;

a top enclosure adapted to engage said first and second end walls to maintain a predetermined spacing between said first and second end walls as said horizontally adjustable securement means of said end walls are urged against the respective opposed walls of the room; and

means for securing said first and second end walls to said bathtub.

4,180,875

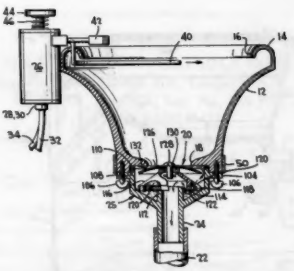
URINE DISPOSAL BYPASS UNIT

Porter C. Wilson, P.O. Box 11010, Tucson, Ariz. 85734

Filed May 16, 1978, Ser. No. 906,415

Int. Cl.[2] E03D *13/00, 11/02, 9/02*

U.S. Cl. 4—309 **15 Claims**



1. A urine disposal bypass unit comprising a bowl having a top peripheral edge defining an opening for receiving urine and a bottom outlet for disposing of the urine and presenting an annular valve seat;

a valve housing at the outlet side of the valve seat;

one-way valve means disposed at said outlet of said bowl and including a normally biased closed valve plate within the housing for selective opening and closing movements relative to said valve seat and movable under influence of liquid thereon for selective relative cooperation with said valve seat in open position to permit downward flow of urine therethrough and in closed position to prevent gases from flowing upward therethrough into said bowl, said one-way valve means including a support member within the housing mounting the valve plate and cooperating with the housing in defining a liquid trap for maintaing a

predetermined volume of liquid below said outlet; said valve plate comprises a disk member centrally mounted on said support member and normally biased to seated closed position on the valve seat;

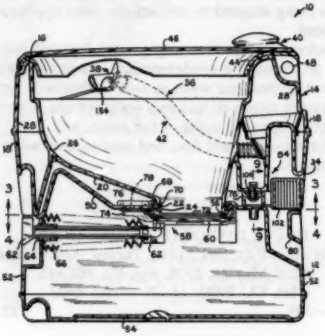
drain conduit means having a first end coupled with said one-way valve means to receive liquid from said outlet of said bowl and a second end adapted to be coupled with a main drain; spray means mounted on said bowl to supply flushing liquid to said bowl; and

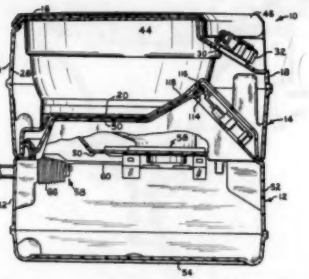
flush valve means mounted on said bowl to supply flushing liquid to said spray means whereby the flushing liquid is maintained in said liquid trap in said one-way valve means.

4,180,876
PORTABLE TOILETS

Frank T. Sargent; John M. Antos; Arthur W. Henke, all of Ann Arbor; John A. Hoffman, Brighton, and Erin J. Lindsay, Ann Arbor, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Nov. 6, 1978, Ser. No. 957,799
Int. Cl.[2] E03D *5/012, 11/10*; F16K *1/16*
U.S. Cl. 4—321 **18 Claims**



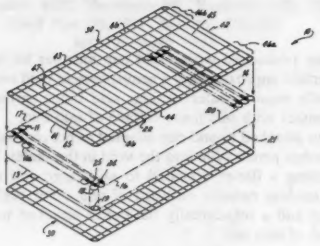


1. A portable toilet comprising a portable lower holding tank section and a portable upper seat section removably supported thereon, said seat section having top, side and bottom walls with an outlet port in its bottom wall and defining a bowl extending between said top and bottom walls and opening at the bottom to said outlet port, said holding tank section having a top wall and side and bottom walls forming a closed receptacle with an inlet port in its top wall in registry with said outlet port, and a valve assembly mounted on said holding tank section for opening and closing said inlet port, characterized in that the holding tank section and the seat section have disengageable interlocking means in their respective top and bottom walls adjacent to one of the sides of the sections, said interlocking means including hinge-like elements located in said top and bottom walls and interconnected to provide a hinge axis for pivotal movement of the seat section relative to the holding tank section, the seat section being disengageable from the holding tank section when the seat section has been pivoted about said axis of the interlocking means a preselected number of angular degrees relative to the holding tank section, and the holding tank section and the seat section have releasable clasp means adjacent to another of the sides of the sections opposite from said one side for releasing or securing the sections respectively for or against pivotal movement relative to one another.

4,180,877
MATTRESS

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 22, 1978, Ser. No. 944,914
Int. Cl.[2] A47C *23/02*
U.S. Cl. 5—263 **7 Claims**



1. An improved mattress comprising,

a coil spring assembly including a plurality of coil springs arranged in a matrix configuration having a plurality of transverse coil spring rows and a plurality of longitudinal coil spring columns, said transverse rows and longitudinal columns of coil springs being interconnected by helical lacing wires,

two wire grids sized to overlie a desired and pre-selected surface area of that coil spring matrix, one of said wire grids being located on the top surface of said mattress, and the other of said wire grids being located on the bottom surface of said mattress, each of said wire grids having a border wire and a plurality of grid wires welded to said grid border wire, each of said wire grids being constructed as a preformed subassembly prior to connection with said coil spring assembly, and said coil spring assembly being constructed as a preformed subassembly prior to connection with said wire grids, and

connector means for connecting each of said wire grids to said coil spring assembly in said pre-selected area.

4,180,878
WATERBED FRAME

Dione H. Howell, P.O. Box 15155, Dallas, Tex. 75201

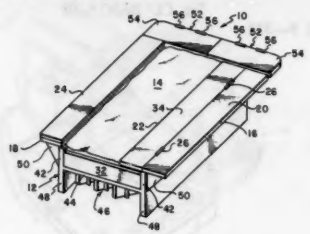
Filed Feb. 27, 1978, Ser. No. 881,357
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—431 **13 Claims**

1. A waterbed frame to be used with a water mattress having a top surface, the waterbed frame comprising, in combination:

a support structure for supporting the water mattress, the support structure including at least one elongated, laterally extending, support ledge for supporting a user while the user is getting into or out of the waterbed, the support ledge having a top surface substantially coplanar with the top surface of the water mattress; and

at least one elongated, substantially rigid, leaf member pivotally connected to the support structure at the water mattress edge of the at least one support ledge, the at least one leaf member being movable between a first position sub-

stantially horizontal above and partially resting on the water mattress and a second position which is substantially out of the way of a water mattress user wherein the



leaf member serves as a transition member when in the first position whereby the leaf member helps a user transfer from the support ledge to the water mattress and from the water mattress to the support ledge.

4,180,879

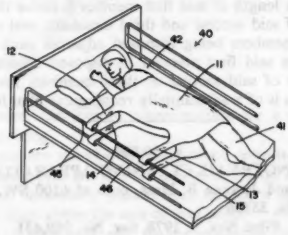
BODY POSITIONER

Rose A. Mann, 1368 Pleasant, St. Paul, Minn. 55102

Filed Aug. 4, 1978, Ser. No. 930,990

Int. Cl.[2] A61G *7/10*

U.S. Cl. 5—508 **10 Claims**



1. A body positioner for holding a person lying on a bed having a rail, said body positioner comprising a sheet of material having a length equal to or greater than the torso length of the person lying on the bed, said body positioner having a first section of width W and a second section of width X, the width W sufficiently large so that the said first section is operable for encompassing the larger portion of the torso of a patient lying on the bed, said width X being less than the width W but sufficiently large to encompass the smaller portion of the torso of a person lying on a bed, said body positioner reversible so that if a patient has a smaller upper torso, said section of width X can be placed around the upper torso of the patient, but if a patient has a larger upper torso, said section of width X can be placed around the upper torso of the patient, and means for securing said body positioner to the rail of a bed.

4,180,880

METHOD OF PREVENTING ESCAPE OF DYE FLUID BETWEEN DYE BEAMS AND CONVOLUTED TEXTILE MATERIAL

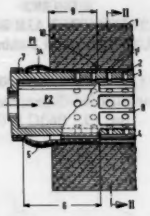
Vilem Stritzko, Strengelbach, Switzerland, assignor to Bleiche AG Zofingen, Zofingen, Switzerland

Filed Oct. 13, 1977, Ser. No. 841,946

Claims priority, application Switzerland, Oct. 20, 1976, 13288/76

Int. Cl.[2] D06B *5/22*

U.S. Cl. 8—154 **6 Claims**



1. A method of controlling the flow of pressurized dye fluid from the interior of a foraminous tube whose external surface is surrounded by a roll of convoluted textile material intermediate the axial ends thereof, comprising the steps of establishing a deformable and at least substantially impermeable tubular barrier externally of the tube between each axial end of the tube and the interior of the respective axial end of the roll so that a tubular zone of the barrier extends into the interior and overlaps the respective axial end of the roll from within; and maintaining the barriers in sealing engagement with the tube in regions spaced apart from the respective axial ends of the roll so that the fluid which flows outwardly through the foraminous tube effects at least some radial expansion of the barriers and biases the tubular zones of the barriers against the roll from within but is prevented from escaping by flowing axially between the interior of the roll and the external surface of the tube.

4,180,881

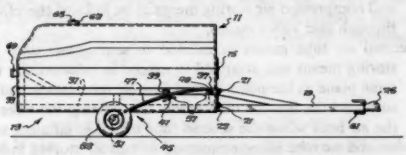
FOLDING TRANSPORTABLE BOAT

James L. Speranza, 7804 Ridge Rd., Gasport, N.Y. 14067

Filed Jan. 16, 1978, Ser. No. 869,957

Int. Cl.[2] B63B *7/02*

U.S. Cl. 9—2 F **8 Claims**



1. A folding transportable boat comprising: a bow boat section and a stern boat section, said sections being hinged together whereby said bow section may be folded back over said stern section; said stern section being provided with an internal frame within the material forming said section; a tow bar adapted for use on a trailer hitch, said tow bar being removably attached to said frame and extending longitudinally forward from said stern section; and independent suspension means carried by said stern section on opposite outer sides thereof and readily removable therefrom, each of said suspension means comprising a rotatable wheel and a leaf spring, said spring having one end thereof attached to said wheel and the other end thereof removably attached to said frame; and means carried by said frame and projecting outwardly from said stern

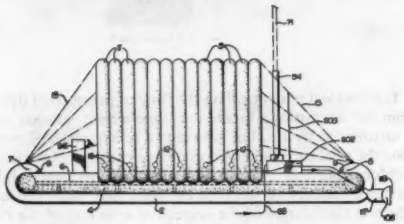
section removably supporting said spring s intermediate of their ends.

4,180,882

LIFESAVING AIR BOAT

Motojiro Kawasaki, 15-3 Akatuka 2-chome, Itabashi-ku, Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,404
Claims priority, application Japan, Sep. 7, 1976, 51-106257
Int. Cl.[2] B63C 9/04
U.S. Cl. 9—11 A **12 Claims**



1. A lifesaving air boat comprising a rigid supporting structure:

means for storing compressed air secured to one side of said supporting structure substantially and centrally thereof and extending over the opposite ends to the opposite side thereof, the storing means being exposed to the water on the water side of the supporting structure when the air boat is immersed and floated on the body of water, valve means having manually operated release means for controlling the flow of the compressed air stored in said compressed air storing means, first air tube means secured to said supporting structure and adapted to form a bottom surface for the boat arranged on opposite sides of the supporting structure and substantially coextensive therewith for forming a floatable surface when the tube means are inflated, said first air tube means being connected to said compressed air storing means to be inflated therefrom through said valve means,

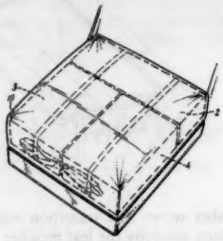
second air tube means connected to said compressed air storing means and arranged to extend in substantially the same plane as the plane of said first air tube means and to surround the first air tube means for defining the sides of the air boat when the second tube means is inflated, said second air tube being connected to said air storing means to be inflated therefrom along with said first air tube means through said valve means, third air tube means supported on the second air tube means and adapted to be inflated by means of the stored compressed air to form an enclosure within the thus defined air boat and including air regulating valve means arranged with each of said air tube means for closing off the individual air tube means when the air pressure in the individual tube means reaches a preselected pressure level, whereby a floating air boat is provided upon the first, second and third air tube means being inflated as a result of the manual operation of the release means for the compressed air storing means that will readily restore itself to an upright position even when capsized.

4,180,883

BUOYANCY AID

Walter Oldham, Rochdale, England, assignor to Beaufort (Air-Sea) Equipment Limited, Cheshire, England

Filed Dec. 13, 1977, Ser. No. 860,197
Int. Cl.[2] B63C 9/08
U.S. Cl. 9—312 **13 Claims**



1. A cushion convertible into a life preserver which comprises:

a first, second, and third separate member made of bouyant material, said first, second, and third members being disposed adjacent each other in substantially the same plane so as to form said cushion for seating wherein, upon being worn as said life preserver, said first member is disposed adjacent to and behind the head of the wearer and said second and third members are disposed adjacent each other on the chest of the wearer;

a plurality of loop members secured to each of said first, second and third members;

a first tape disposed within said plurality of loop members of said second and third members so as to interconnect said second and third members wherein ends of said first tape are drawn in opposite directions around the body of the wearer and are secured together upon being worn as a life preserver; and

a second tape disposed within said plurality of loop members of said first member and interconnecting said second and third members wherein each of said first, second and third members upon forming said cushion are of the same depth and the length of said first member is twice the width of each of said second and third members, said second and third members being disposed adjacent each other and wherein said first member is disposed adjacent an end portion of said second or third members such that the cushion is of a substantially rectangular plan form.

4,180,884

FINGERNAIL CLEANING APPARATUS

Don Hess, and JoAnna B. Hess, both of 6100 SW. 120th St., Miami, Fla. 33156

Filed Nov. 9, 1978, Ser. No. 959,431
Int. Cl.[2] A46B 13/04
U.S. Cl. 15—21 R **8 Claims**

1. A fingernail cleaning apparatus comprising:

a housing for receiving liquid;

disc-shaped brush means supported rotatably in a substantially horizontal plane within said housing for brushing fingernails while wet with said liquid;

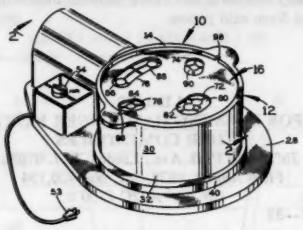
motor means operatively connected to said brush means for rotating said brush means about a central axis thereof;

and guide means forming finger entrances for said housing above said brush means to allow insertion of only fingers into said housing into contact with said brush means for cleaning the fingernails;

said finger entrances including four finger entrances on one lateral side of the axis of rotation of said brush means;

and a fifth finger entrance on the opposite lateral side of the axis of rotation of said brush means;

whereby four fingers of one hand may be inserted respectively in said four finger entrances for brushing the nail thereof across the width of the nail and the thumb of the



same hand may be inserted in said fifth finger entrance at the same time for brushing the nail thereof across the width of the nail.

4,180,885

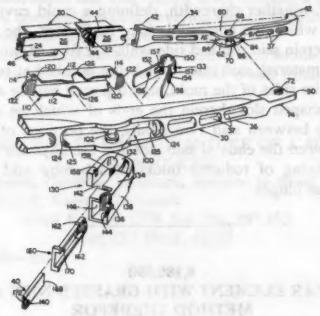
WINDSHIELD WIPER

Donald I. Thornton, Warwick, R.I., and Richard H. Peyton, Berkley, Mass., assignors to Fram Corporation, East Providence, R.I.

Filed May 26, 1977, Ser. No. 800,694

Int. Cl.[2] B60S *1/40*

U.S. Cl. 15—250.32 **3 Claims**



1. A pressure distributing superstructure for a windshield wiper, comprising

a plastic primary yoke having at each end oppositely extending, coaxial pins and a lobe beyond said pins, and

two plastic secondary yokes, each having a pair of ears spaced apart along the axis of said pins,

said ears of each said pair having opposing openings for receiving said pins of one end of said primary yoke, a shoulder above each said opening to retain said pins therein, and a downwardly and inwardly sloping ramp above each said shoulder,

the ends of said pins of a said pair being separated by more than the minimum spacing of said ramps,

said ears being sufficiently resilient so that when said pins are forced between said ramps said ears will temporarily be flexed apart to allow said pins to snap into said openings,

each said secondary yoke being assymmetric longitudinally about said ears, whereby said yoke has long and short legs on opposite sides of said ears,

each said secondary yoke having between its said ears a pair of contoured stop surfaces convex to said pins, said ears having opposing, parallel bearing surfaces extending between said stop surfaces and said pins as well below said openings,

the ends of said primary yoke including said lobes having bearing surfaces normal to said axis and surrounding said pins, said bearing surfaces of said primary yoke being in bearing contact with those of said secondary yoke,

said lobes having concave bottom surfaces at their ends extending beyond said pins to overlie said convex stop surfaces to limit the upward pivotal movement of the outer ends of said secondary yoke about said axis.

4,180,886

WINDSHIELD WIPER SYSTEM

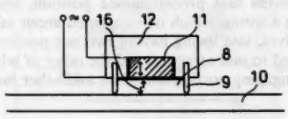
Wilhelm Scherz, Bergwerkstr. 5, D7180 Crailsheim, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,915

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2734637

Int. Cl.[2] B60S *1/46*

U.S. Cl. 15—250.04 **4 Claims**



1. A wiper assembly for a windshield comprising in combination

(a) a wiper blade member that is adapted to be disposed in an essentially parallel relationship to a windshield,

(b) a wiper lip mounted on the bottom side of said wiper blade member, said wiper lip being in the form of a continuous seal lip of elongated oval shape that establishes an essentially closed cavity between said wiper blade and said windshield,

(c) inlet means in said wiper blade member for the introduction of cleaning liquid into the interior of said cavity,

(d) means for forcing said cleaning fluid into said cavity under a positive pressure that is large enough to cause said liquid to be squeezed outwardly between the lower edge of said continuous seal lip and the windshield, said cavity having no other outlet to remove said cleaning fluid

(e) an ultrasonic wave generator mounted on said wiper blade member so as to supply ultrasonic waves to the cleaning liquid within said cavity,

whereby upon the simultaneous (i) introduction of cleaning liquid into said cavity under pressure and (ii) the generation of ultrasonic waves through the liquid within said cavity a cushion of pressurized and ultrasonically vibrated liquid is formed which enables the wiper blade to move over the windshield with a hovercraft effect.

4,180,887

VACUUM-CLEANER ATTACHMENT

Egon Wudel, Velbert, and Georg Haase, Radevormwald, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal

Filed Jan. 16, 1978, Ser. No. 869,855

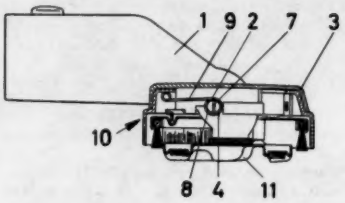
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 7701111[U]

Int. Cl.[2] A47L *9/06*

U.S. Cl. 15—415 R **4 Claims**

1. A vacuum-cleaner attachment comprising, in combination, a mouthpiece member bounding a suction space; a suction nipple member; means for so mounting said members on one another that said suction nipple member communicates with said suction space and is movable relative to said mouthpiece member along a plane which is substantially normal to a surface being vacuum cleaned during the use of the attachment, said mounting means including at least one pivot which con-

nects said members for relative pivoting along said plane, said pivot being rigid with one of said members and having an extension; and biasing means interposed between said members for urging one of said members toward a predetermined position relative to the other of said members, and to said surface in response to movement of said other member and including



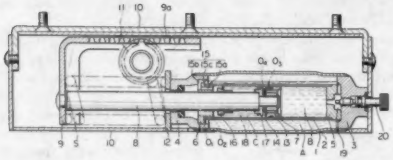
an elastic element which is affixed to said extension and has an engaging portion that acts on the other of said members to urge the same towards said predetermined position, said elastic element being a spring which is convoluted about said extension of said pivot, said spring having two end portions one of which is affixed to said extension and the other of which constitutes said engaging portion and abuts said other member.

4,180,888

DOOR CLOSER

Toshiro Nagase, Sagamihara, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Mar. 14, 1978, Ser. No. 886,584
Claims priority, application Japan, Mar. 19, 1977, 52/33999
Int. Cl.[2] E05F *3/22*
U.S. Cl. 16—58 **2 Claims**



1. A door closer comprising:

an inner cylinder receiving therein oil;

an outer cylinder surrounding said inner cylinder and defining therebetween an annular chamber receiving therein gas and oil;

a piston slidably fitted within said inner cylinder and dividing the interior of said inner cylinder into first and second oil chambers;

a piston rod secured to said piston and extending through said first oil chamber and out of said inner cylinder for connection to a door;

said piston rod being movable inwardly of said inner cylinder to a first position whereat said piston reduces the size of said second oil chamber, and said piston rod being movable outwardly of said inner cylinder to a second position whereat said piston reduces the size of said first oil chamber;

restoring force means for storing a restoring force when said piston rod is moved toward said first position and for urging said piston rod to be moved to return toward said second position;

passage means in an end of said inner cylinder for providing fluid connection between said first oil chamber and said annular chamber;

valve member means, slidably mounted on said piston rod within said first oil chamber, for cooperating with said passage means and for reducing the effective passage area thereof when said piston rod reaches a position adjacent said second position thereof; and

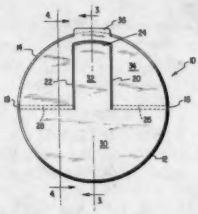
spring member means, having opposite ends thereof connected to said piston and to said valve member means, for normally retaining said valve member means in a position spaced from said piston.

4,180,889

MOLDS FOR FORMING HAMBURGER PATTIES AND OTHER COMESTIBLES

Edward J. Joffe, 940 Park Ave., Linden, N.J. 07036

Filed Aug. 2, 1978, Ser. No. 930,134
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **7 Claims**



1. In a mold for forming a comestible and having a substantially planar top wall and side walls projecting from said top wall and, together therewith, defining a mold cavity of the shape to which the comestible is to be formed, the improvement wherein said top and side walls are formed integrally of a plastic material, said side walls being notched at two points on opposite sides of the mold, said top wall having a substantially U-shaped slot therein the ends of which lie on a line extending between said two points, the portions of said top wall between the ends of said slot and the adjacent side wall notches being of reduced thickness whereby said portions function as hinges.

4,180,890

LINEAR ELEMENT WITH GRAFTED NIBS AND METHOD THEREFOR

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., Montclair, N.J.

Continuation of Ser. No. 625,278, Oct. 23, 1975, which is a continuation of Ser. No. 401,084, Sep. 26, 1973, Pat. No. 3,922,455, which is a continuation of Ser. No. 256,068, Oct. 23, 1972, abandoned. This application May 4, 1977, Ser. No. 793,652
Int. Cl.[2] A44B *17/00*; D02G *3/00*; B05D *1/24*
U.S. Cl. 24—204 **17 Claims**

1. A method of making filament which comprises heating a mass of heat softenable nibs which are capable of being fused to a monofilament, contacting a monofilament with a mass of said nibs while said nibs are in a heat softened condition and bonding said nibs to said monofilament to form a composite filament comprising grafted nibs fused to said monofilament.

5. A method for making self-gripping devices comprising tufting composite filaments made according to claim **1** and tufting said filaments to a base.

4,180,891

FASTENER FOR BANDS OR THE LIKE

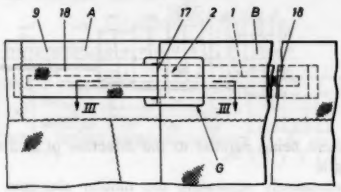
Alberto Stocker, Wuppertal, Fed. Rep. of Germany, assignor to Schaeffer Homberg GmbH, Wuppertal, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,696

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1978, 2800288

Int. Cl.[2] A44B *19/00*; A41D *1/06*

U.S. Cl. 24—206 B **9 Claims**



1. A fastener for a band or the like, particularly on pants, skirts, pockets or the like, with a covering strip, comprising

a catch rail adapted to be fastened on one part of the band,

a slide displaceably disposed on said catch rail, said slide being adapted to be operatively fastened on another part of the band constituting a slide-side band-fastening position,

a folding lever being pivotally mounted on said slide defining a folding axis,

said folding lever extending under said folding axis to a catch projection, said catch projection adapted to engage with said catch rail, said folding lever forming a window-shaped opening, the strip covering said catch rail and said slide extends through said opening,

said slide-side band-fastening position of said another part of said band being operatively fastened to said folding lever.

4,180,892

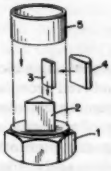
METHOD FOR THE MANUFACTURE OF A FORCE TRANSDUCER

Jorgen Jensen, Gentofte, Denmark, assignor to Bruel & Kjaer Industri A/S, Naerum, Denmark

Filed Apr. 18, 1978, Ser. No. 897,373

Int. Cl.[2] H01L *41/22*

U.S. Cl. 29—25.35 **1 Claim**



1. A method for the manufacture of a force transducer of a material supplied in rod form, which force transducer consists of a base carrying a stud which carries a set of shear sensitive elements, each having a seismic or force transmitting mass attached to it, the masses being fixed to the shear sensitive elements, and the shear sensitive elements being fixed to the stud by means of a cylindrical spring clip surrounding the seismic or force transmitting masses and supplying elastic force through the elements to be fixed to the stud, a cover fixed to the base and carrying a plug for electrical connection to the shear sensitive elements, which method for manufacture comprises the following steps:

(1) the cutting of slots which are parallel to the axis of the rod and having a depth which is greater than the height of the shear sensitive elements,

(2) the insertion of the shear sensitive elements into said slots,

(3) the pressing of the cylindrical spring clip around the slotted part of the rod, and

(4) cutting radially into the rod so as to remove the material making up the bottom of said slots, the steps to be taken in the order given.

4,180,893

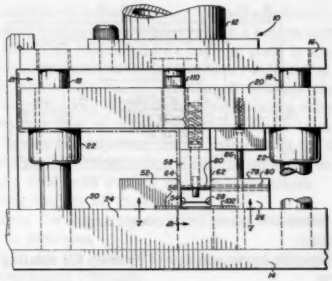
APPARATUS FOR CUTTING A SEGMENT FROM A STRIP OF FILM AND MOUNTING THE SEGMENT IN A FIXTURE

Max Avalon, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Jul. 3, 1978, Ser. No. 921,640

Int. Cl.[2] B23Q *39/02*

U.S. Cl. 29—33 K **12 Claims**



1. Apparatus for cutting a segment from a film strip having a plurality of equal sized segments with a segment boundary between adjacent segments and for mounting a segment cut from the strip on a reusable fixture having segment retaining means, comprising:

a punch press, said punch press having a base plate, a top plate and a punch holder;

means for reciprocally moving substantially vertically the punch holder relative to the base plate between a first position in which the base plate and the punch holder are separated by a maximum distance and a second position in which they are separated a minimum distance;

a die having a planar die cutting surface and a die cutting edge lying in the die cutting surface;

means for mounting the die on the base plate;

a die block, said die block having a planar stabilizing surface;

means for mounting the die block on the base plate so that the die block is positioned so that its stabilizing surface is substantially parallel to the die cutting surface and spaced from the die cutting surface a distance substantially equal to the length of a segment;

a punch having a segment mounting surface substantially the same size as a segment, a cutting surface and a support surface, the intersection of the cutting surface and the mounting surface forming a punch cutting edge;

means for mounting the punch on the punch holder so that the punch is positioned so that the punch and die cutting edges can be placed in cutting relationship to each other and so that the support surface of the punch slidably engages the stabilizing surface of the die block;

means for positioning a film strip so that a segment boundary lies in the plane of the die cutting surface and a segment of the strip substantially directly underlies the segment mounting surface of the punch;

segment holding means mounted on said punch for holding a segment placed directly under the segment holding

surface of the punch and to prevent relative movement of a severed segment relative to the punch as the punch holder moves from its first to its second position;

means for positioning a fixture under the segment cutting surface of the punch so that the segment retaining means of the fixture are directly under the segment mounting surface of the punch whereby the segment retaining means retain the severed segment as the punch holder moves from its second position to its first.

4,180,894

AUTOMATIC TURRET LATHE

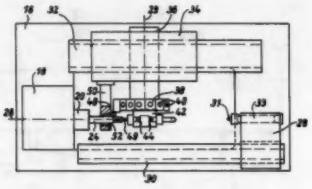
Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke Kommanditgesellschaft Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,726

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737664

Int. Cl.[2] B23B *3/16, 3/00, 25/00, 39/20*

U.S. Cl. 29—36 **12 Claims**



1. An automatic turret lathe comprising

a bedplate;

a main spindle having an axis of rotation for rotating a workpiece;

a headstock on the bedplate carrying the main spindle;

a tailstock slidably arranged on the bedplate and spaced longitudinally from the headstock;

a main turret which is indexable about an indexing axis oriented transverse to said axis of rotation and has a plurality of main tool carriers;

a removable supplementary turret disposed on the same indexing axis as the main turret and having a plurality of supplementary tool carriers arranged so as to form pairs with respective main tool carriers, the supplementary tool carriers being closer to the indexing axis than the main tool carriers; and

a support on which both turrets are mounted and which is slidable in longitudinal and transverse directions on the bedplate.

4,180,895

METHODS OF FORMING ANGLED END BEARING LINERS

Roger H. Spikes, Marlow, and William J. G. Blackburn, Stanmore, both of England, assignors to Vandervell Products Limited, Maidenhead, England

Filed Apr. 26, 1978, Ser. No. 900,374

Claims priority, application United Kingdom, Apr. 26, 1977, 17448/77

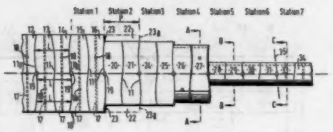
Int. Cl.[2] B21D *53/10*

U.S. Cl. 29—149.5 C **10 Claims**

1. A method of making bushes having the plane of at least one axial end thereof inclined to the longitudinal axis of the bush, comprising:

(a) scoring strip material to provide a succession of groups of bush blanks so that adjacent edges of adjacent blanks in each group lie along common score lines, such common score lines having an undulating wave form and a length of one wave length, and so that each group of blanks is provided on a portion of the strip material of uniform length;

(b) successively forming the groups of the blanks to a circular cross-section tubular element consisting of a plurality of bushes interconnected along said common score lines between them, all the blanks of each group being so formed simultaneously and the longitudinal axis of the



element being parallel to the direction of said uniform length;

(c) successively separating the tubular elements, or the groups of blanks before forming into such elements, from the remainder of the strip material; and

(d) separating the bushes of each group from each other along said common score lines.

4,180,896

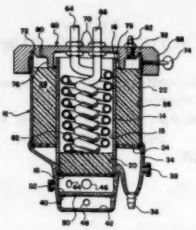
BLOOD OXYGENATOR ASSEMBLY METHOD

Charles C. Reed; Denton A. Cooley, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Division of Ser. No. 865,476, Dec. 29, 1977. This application Oct. 16, 1978, Ser. No. 952,020

Int. Cl.[2] A61M *1/03*

U.S. Cl. 29—157 R **2 Claims**



1. A method of assemblying a blood oxygenator having (1) a disposable multichambered receptacle including an oxygenating chamber, a defoaming chamber integral with and in the immediate proximity of at least a portion of said oxygenating chamber, means for communicating blood flow from said oxygenating chamber to said defoaming chamber and an arterial reservoir and (2) a reusable sterilizable heat exchanger for exchanging heat with blood passing through said oxygenating chamber comprising an oxygenator cover and a heat exchanger means projecting therefrom, the method comprising the steps of:

placing a defoaming means insert into the defoaming chamber such that the insert conforms to the configuration of the defoaming chamber;

telescopically interposing at least a portion of the heat exchanger means into the oxygenating chamber so that a heat exchanging portion thereof will be immersed in blood flowing through the oxygenating chamber; and

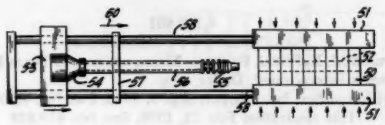
removably securing the oxygenator cover to the receptacle.

4,180,897

METHOD OF FABRICATING HONEYCOMB HEAT EXCHANGER

Dwight H. Chester, Ellisdale Rd., Allentown, N.J. 08501

Continuation of Ser. No. 779,326, Mar. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 620,826, Oct. 8, 1975, abandoned. This application Sep. 15, 1978, Ser. No. 942,474
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 A 13 Claims



1. A method of fabricating a heat exchanger comprising the steps of:

(a) forming an expandable stack of bonded foil sheets, each having a coaxial aperture of a relatively circular configuration,

(b) expanding said stack to form a honeycomb member of a predetermined length, with said apertures aligned to provide a channel through said expanded member, said apertures in said expanded stack deformed into a relatively elliptical configuration,

(c) joining a spin tool to a circular tube of a length selected by said predetermined length,

(d) rotatably advancing said spin tool and said tube through said elliptical aperture to cause said tool to burnish and bore said aperture to form a circular aperture having a random peripheral edge pattern about said aperture to cause said tube as joined with said tool to firmly coact said honeycomb member.

9. A method of fabricating a heat exchanger comprising the steps of:

(a) forming an expandable stack of bonded foil sheets, each having a coaxial aperture of a relatively circular configuration,

(b) expanding said stack to form a honeycomb member of a predetermined length, with said apertures aligned to provide a channel through said expanded member, said apertures in said expanded stack deformed into a relatively elliptical configuration,

(c) joining said spin tool to a circular tube of a length selected by said predetermined length, said spin tool having a front smooth pilot section of a diameter approximately equal to the diameter of said coaxial apertures prior to expansion, a first sharp threaded section followed by a relatively smooth transistion section followed by a second threaded section having a flat threaded arrangement and of the same pitch as said first section, said flat threaded arrangement being defined by a diameter smaller than the diameter of said first sharp threaded section,

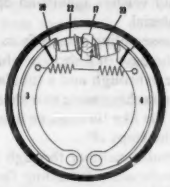
(d) rotatably advancing said spin tool and said tube through said elliptical aperture to cause said tool to bore through said aperture to form a circular aperture, while forming a threaded portion about said tube as coupled to said honeycomb, said spin tool serving to flatten the edges of the foil aperture as it is rotated to cause said tube to firmly coact with said honeycomb member.

4,180,898

METHOD OF REPLACING BRAKE FORCE TRANSMISSION PARTS IN VEHICLE WHEEL BRAKES

Sven E. Camph, Malmo, and Bertil K. A. Holmgren, Trelleborg, both of Sweden, assignors to Camph Engineering Company AB, Malmo, Sweden

Filed Jun. 23, 1978, Ser. No. 918,388
Claims priority, application Sweden, Jul. 15, 1977, 7708220
Int. Cl.[2] B23P *7/00, 15/18*
U.S. Cl. 29—402.07 1 Claim



1. The method of replacing brake force transmission parts in vehicle wheel brakes of the type in which a key mounted on a rotatable key shaft journalled in a backing plate is adapted to move a pair of brake shoes towards an inner cylindrical surface of a brake drum with transmission parts wherein the brake force between the key and the ends of the brake shoes being performed by a pair of new compression force transmitting members having self-adjusting length, comprising the steps of,

(a) removing the compression force transmitting members, the key shaft with the key and the brake shoes,

(b) cutting the key off from the key shaft,

(c) holding the brake shoes in a fixture in predetermined relative positions,

(d) cutting off the ends of the brake shoes according to a predetermined template,

(e) substituting new ends,

(f) securing by welding the substituted ends,

(g) welding a new key to the key shaft prior to the next step,

(h) refitting the key shaft and the brake shoes in the backing plate, and

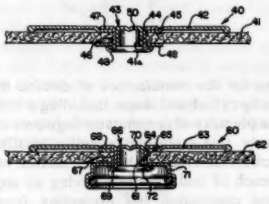
(i) fitting new compression force transmitting members between the new key and the substituted ends of the brake shoes.

4,180,899

METHOD OF ASSEMBLING A FASTENER

Ronald M. Mikosinski, 5852 Augusta Blvd., Chicago, Ill. 60651

Filed Aug. 9, 1977, Ser. No. 823,034
Int. Cl.[2] B21D *39/00;* B23P *11/00*
U.S. Cl. 29—512 2 Claims



1. In a method of assembling a decorative attachment from a generally cylindrical disk, such as the base of a shotgun shell which includes a central aperture therethrough and a tubular member such as a primer casing, and attaching same to a sheet of material such as fabric, leather and the like through an aperture therein; said method comprising the steps of:

positioning said tubular member through said disk aperture

until a radially outwardly extending flange positioned at one end of said tubular member engages an external face of said disk;

inserting said tubular member through said aperture in said sheet of material until of a back surface of said disk engages a surface of said sheet of material;

positioning a washer over the distal end of said tubular member with said member extending through a central aperture on said washer; and

curling the distal end of said tubular member outwardly to fixedly retain said washer against an opposing surface of said sheet of material.

2. In a method of assembling a snap from a generally cylindrical disk, such as the base of a shotgun shell which includes a central aperture therethrough and a tubular member such as a primer casing, and attaching same to a sheet of material such as fabric, leather and the like through an aperture therein; said method comprising the steps of:

positioning said tubular member through said disk aperture until a radially outwardly extending flange positioned at one end of said tubular member engages an external face of said disk;

inserting said tubular member through said aperture in said sheet of material until a back surface of said disk engages a surface of said sheet of material;

positioning a snap socket member over the distal end of said tubular member with said member extending through a central aperture on said socket member; and

curling the distal end of said tubular member radially outwardly to fixedly retain said snap socket against an opposing surface of said sheet of material.

4,180,900
APPARATUS FOR MAKING A COMMUTATOR FOR AN ELECTRIC MOTOR

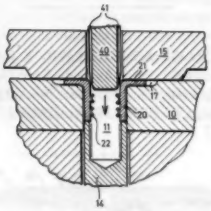
Otto Klein, Wemding, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,870

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709433

Int. Cl.² H01R *43/06*

U.S. Cl. 29—566 **4 Claims**



1. Apparatus for the manufacture of electric motor armatures of generally cylindrical shape, including a body of plastic material with a plurality of commutator segments embedded in said plastic body, said segments extending axially along and being spaced circumferentially about the surface of said cylindrical shape, each of said segments having an angularly oriented electrical connection lug projecting from one end thereof, comprising:

first means including a mold intermediate plate having a cavity of circular cross-section through the thickness of said plate and a plurality of elongated grooves in a surface of said plate extending radially outward from the perimeter of said cavity, said grooves being spaced to receive said lugs of said segments, thereby locating said segments circumferentially about said cavity perimeter;

second means comprising a separating web extending radially inward within said cavity for a predetermined radial distance between each adjacent pair of said segments; and

third means comprising a wedging tool having at least one axial ridge corresponding to each of said segments, for inelastically deforming each of said segments when axially inserted into said cavity and thereafter withdrawn to form a sealing bead on at least one adjacent segment edge adjacent to a separating web, said sealing bead acting to prevent flow of a subsequently injected hardenable plastic material in an initial fluid condition into the outer peripheral air gaps between adjacent segments.

4,180,901
COMPACT PTC RESISTOR

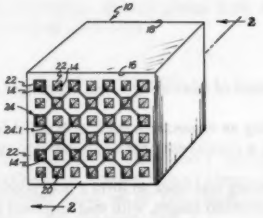
Bernard M. Kulwicki, Foxboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 721,727, Sep. 9, 1976, Pat. No. 4,107,515.

This application Feb. 21, 1978, Ser. No. 879,828

Int. Cl.² H05B *3/08*

U.S. Cl. 29—621 **4 Claims**



1. A method for making a compact, rugged resistor device comprising the steps of providing a body of resistor material of positive temperature coefficient of resistivity having outer side and end surfaces and having a plurality of passages extending through the body in spaced, side-by-side relation to each other between opposite end surfaces of the body, coating the inner walls of said passages with electrically conductive material to form ohmic contacts to said resistor material, electrically connecting the coatings in alternate ones of said passages to form one device terminal, and electrically connecting the coatings in the other of said passages to form a second device terminal.

4,180,902
HEAT EXCHANGER TUBE GUIDE AND EXTRACTOR TOOL THEREFOR

Robert E. Dunn, Franklin Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 21, 1978, Ser. No. 898,348

Int. Cl.² F28F *7/00*

U.S. Cl. 29—726 **6 Claims**

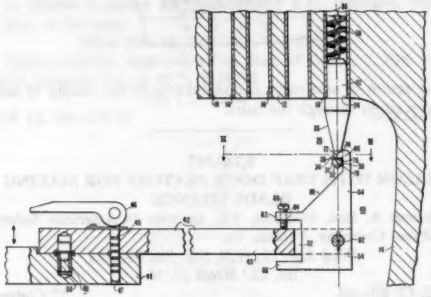
1. An improved tube guide means for guiding tubes into apertures through the tube sheet of a steam generator and tool means for extracting said guide once said tube is properly positioned, said guide means including means for releasably retaining it within the open end of said tube and having a generally conically-nosed leading end for projecting outwardly from said tube to guide said tube through said aperture, said improvement comprising:

a tip portion on the leading end of said guide means defining an upwardly outwardly diverging frustoconical wall terminating in a cylindrical coaxial upwardly extending stem portion of less diameter than the frustoconical wall and forming an annular shoulder at the juncture of the two; and

a tool means comprising a tool member pivotally supported on a tool-holder arm for rotation in a vertical plane and normally biased to rotate about said support, and means

for preventing said rotational movement beyond a preset position;

said member defining an upwardly extending portion terminating in a hook portion projecting generally horizontally in the direction of the biased rotation and having a vertical notch to thereby define a pair of spaced, identical configured hooks having an upwardly facing downwardly angled surface meeting with the underside of said hooks to form the hook tips, and wherein said notch is of sufficient width to receive said cylindrical stem of said guide means with said hooks engaging said annular shoulder, and



wherein said hooks extend from one side of said guide to across the axis of the guide for engagement of the hook tips on the shoulder beyond said axis; and

whereby elevation of said tool means from beneath said guide means causes a camming action on said upper surface of said hook portion to pivot said tool means against the biased rotation until the underside of said hook portion is elevated to said annular shoulder whereupon said tool means pivots under the biasing influence to cause said hook tips to engage said shoulder and subsequent downward movement of said tool means extracts said guide means from said tube.

4,180,903

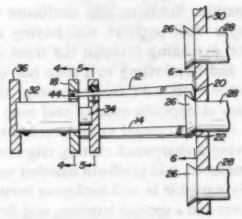
APPARATUS FOR COLLAPSING STEAM TUBES FOR REMOVAL FROM A STEAM BOILER

Joseph Hannigan, Jr., 4407 Rhawn St., Philadelphia, Pa. 19136

Filed Mar. 2, 1978, Ser. No. 882,674

Int. Cl.[2] B21D *41/04*

U.S. Cl. 29—727 **5 Claims**



1. Apparatus for collapsing and removing tubes from a steam boiler, comprising:

a plurality of gripping arms spaced about and extending along a common central axis for engaging the end of a steam tube in the wall of a boiler;

each of said arms having a finger at the distal end thereof, each finger extending inwardly toward the central axis and being shaped for engaging the tube between the wall of the boiler and the outwardly flared end of a steam tube in said wall;

each of said arms being pivotably mounted on a support for movement of said fingers toward and away from said central axis;

a plate having a plurality of openings therein, said plate being positioned between the pivot point of said arms and the distal ends thereof with each arm extending through one of the openings in said plate;

said plate being mounted on an actuator for moving said plate along said central axis from a position forwardly of the pivot for said arms toward the distal ends thereof;

said plate including a bearing surface for bearing against said arms to cam them toward the central axis whereby said fingers engage a steam tube and collapse the same away from the wall of the boiler thereby permitting it to be removed; and

motive means for driving said actuator to move said plate along said central axis.

4,180,904

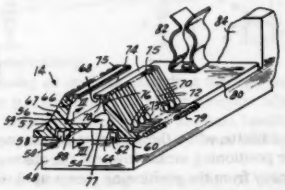
FIELD TERMINATION TOOL HAVING A REMOVABLE CONNECTOR MOUNTING MECHANISM AND AN INSERTION CONTROL MECHANISM

John P. Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 580,577, May 27, 1975, Pat. No. 4,038,745. This application Feb. 14, 1977, Ser. No. 768,578

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—749 **11 Claims**



1. Conductor termination apparatus having releasably engageable connector support and conductor alignment apparatus comprising:

a frame on said conductor termination apparatus;

a base including a portion for receiving an electrical connector thereon;

a pair of comb elements extending from said base to receive a connector therebetween, each of said comb elements including

comb teeth defining conductor receiving slots therebetween which open away from the connector and which are spaced corresponding to the contact spacing of the connector; and

releasable engagement means for releasably mounting said base on said frame, said releasable engagement means including at least one first part carried on said frame, and at least one second part carried on said base, at least one of said parts including spring means for releasably engaging the other of said parts.

4,180,905

AUTOMATIC LOADING DEVICE FOR ROLL FILMS

Ralf L. Klinkhammer, Cologne, and Artur Klotz, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 893,086

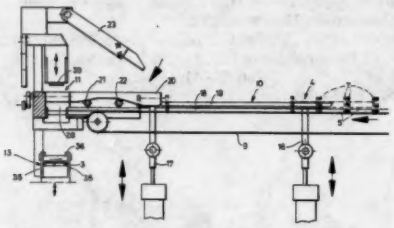
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715605

Int. Cl.[2] B23P *19/04, 21/00*

U.S. Cl. 29—786 **7 Claims**

1. An automatic loading device for inserting roll film into cassettes having separable upper and lower sections compris-

ing a conveyor for supplying roll films, a conveyor for supplying cassettes disposed below the conveyor for the roll films, a loading station having a channel means in the path of movement of the roll film conveyor for receiving roll films from the roll film conveyor, roll film dispenser means mounted between the roll film conveyor and the channel means for dispensing roll films from the conveyor to the channel means one at a time, the cassette conveyor being constructed and arranged to have its path of movement intersect a continuation of the channel means a short distance therefrom, a cassette positioning means disposed at the end of the cassette conveyor in line with the roll film channel means, a pair of holding flaps rotatably mounted at opposite sides of the channel means for releasably holding a roll film inserted into the channel means, cassette separating means mounted between the cassette positioning means and the channel means for removing the upper half of the cassette disposed on the positioning means, transport means connected to the positioning means for moving the cassette towards the channel means, the cassette separating means being constructed and arranged to remove the upper



half of the cassette when the transport means moves the cassette on the positioning means towards the channel means and to hold it away from the positioning means until the roll film is inserted through the channel means into the lower half of the cassette, plunger means mounted in line with the channel means on the opposite side of the channel means from the positioning means, plunger moving means connected to the plunger means for moving the plunger means through the channel means against the roll of film whereby the roll film is discharged from the channel means through the flaps into the lower portion of the cassette, the transport means being also constructed and arranged to carry the lower portion of the cassette with roll film inserted in it past the cassette separating means to a discharge station, the cassette separating means being constructed and arranged to apply the upper half of the cassette over the lower half to close it with the roll film inserted in it, and discharge means at the discharge station for removing the loaded cassette from the positioning means to condition the positioning means for receiving a succeeding empty cassette from the cassette conveyor.

4,180,906

RAZOR WITH ORBITING DISCS WITH SHARP-EDGE SLOTS, AND METHOD FOR MAKING DISCS

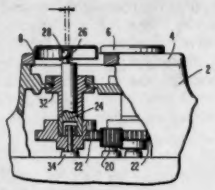
Russell P. May, 109 First Ave., Indialantic, Fla. 32903

Filed Oct. 31, 1977, Ser. No. 847,413

Int. Cl.[2] B26B *19/00*

U.S. Cl. 30—42 **7 Claims**

1. In a razor, a shaving head, at least one generally flat planar disc moveably mounted in said head and having a plurality of apertures therethrough bounded by sharp edges, and means for imparting an orbital motion to said disc relative to said head in the plane of said disc, whereby said sharp edges slice through hairs projecting through said slots from a skin surface against which said disc is engaged, characterized in that the hair-cut-



ting action of said razor is due entirely to the slicing of said sharp edges through the hairs.

4,180,907

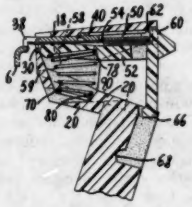
RAZOR WITH TRAP DOOR FEATURE FOR MAKING BLADE CHANGE

Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.

Filed Apr. 12, 1978, Ser. No. 895,551

Int. Cl.[2] B26B *21/16*

U.S. Cl. 30—64 **17 Claims**



1. A razor including

an elongated handle, and

a shaving head connected to one end of said handle, said shaving head comprising

an enclosure extending laterally of said handle at opposite sides thereof and including upper and lower wall segments spaced apart so as to define openings at the front and rear of said enclosure,

a blade guard member fixed in said enclosure adjacently below said upper wall segment and having a frontally directed portion extending through the front opening of said enclosure and terminating in a soap bar spaced outwardly a distance from said front opening, there being blade stop means at opposite ends of said soap bar,

a blade platform member carried in said enclosure,

a razor blade having a sharpened cutting edge received on said platform member, said platform member being pivotally and slidably movable in said enclosure between a first operative position and a second position, said first position being forwardly and upwardly displaced from said second position,

said platform member resting on said enclosure bottom wall segment in said second position,

said platform member moving said razor blade forwardly and upwardly while slidably and pivotably moving from said second to said first position,

said platform member urging said razor blade forwardly through said enclosure front opening against said blade stop means, and upwardly against said guard member in said first operative position,

resilient means engaging said enclosure bottom wall segment

and said platform member and normally urging said platform member into its first operative position, and

detent means operable when said platform member is moved to its second position to hold said platform member in said second position in opposition to the action of said resilient means.

4,180,908

GROOVING TOOL

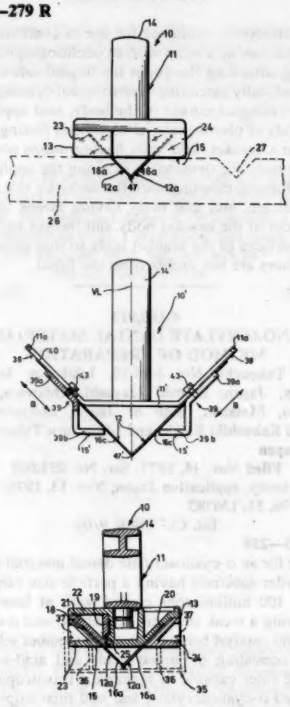
Ewald H. Beermann, Solingen, Fed. Rep. of Germany, assignor to Martor-Argentax E. H. Beermann K.G., Solingen, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 878,077

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706148; Sep. 3, 1977, 2739798

Int. Cl.[2] B26B *3/00*

U.S. Cl. 30—279 R **13 Claims**



1. A grooving tool comprising:

a support forming a substantially planar bearing surface and formed with a pair of generally parallel slots opening at said surface and extending in a predetermined direction, said planar surface being substantially continuous around and between said slots;

a pair of blades staggered in said direction, respectively extending through said slots, and each having a cutting edge inclined to said surface and to said direction;

means for securing said blades on said support with portions of said blades extending beyond said surface and said cutting edges crossing and forming a vertex in projection in said direction on a plane perpendicular to said direction; and

a handle on said support, whereby said tool can be displaced in said direction on a workpiece with said cutting edges excising from said workpiece a strip that is held down by said surface between said blades.

4,180,909

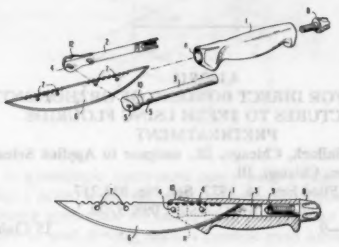
KNIFE WITH EXCHANGEABLE BLADES

Anders Lind, Skälvagen 12, S-792 00 Mora, Sweden

Filed Mar. 14, 1978, Ser. No. 886,375

Int. Cl.[2] B26B *1/00*

U.S. Cl. 30—332 **4 Claims**



1. A knife, comprising:

a handle having an opening extending through said handle, the inside surface of said handle in a region adjacent said opening having a wedge surface and said handle having a single slot extending longitudinally from said opening for receiving a blade;

a replaceable blade having a plurality of spaced holes therein;

a tension rod insertable into said opening;

means for drawing said tension rod towards the one end of said handle for retaining said blade at the opposite end of said handle;

said tension rod comprising two elongate parallel rod portions of rigid material and pins extending laterally from at least one of said rods and being engageable in said holes in said blade for retaining said blade directly between adjacent ends of said rod portions, said rod portions comprising support surfaces for abutment with an upper edge of said blade;

said ends of said rod portions being provided with at least one wedge surface for co-operation with said wedge surface on said handle and said blade extending sufficiently far into said handle to be rigidly secured therein.

4,180,910

IMPLANT FOR AN ARTIFICIAL TOOTH

Fritz Straumann, Waldenburg, and Franz Sutter, Niederdorf, both of Switzerland, assignors to Institut Straumann AG, Switzerland

Filed Oct. 13, 1978, Ser. No. 951,242

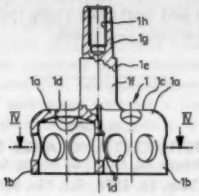
Claims priority, application Switzerland, Oct. 31, 1977, 13203/77

Int. Cl.[2] A61C *13/00*

U.S. Cl. 433—173 **17 Claims**

1. An implant for fixing an articial replacement tooth to a jaw, comprising a post for firmly holding said replacement tooth and at least two hollow cylindrical bodies having parallel

axes, said bodies each being rigidly connected to said post, open at a respective one axial end and having a cylindrical wall



which is intended to be inserted into the bone of said jaw and which is provided with means defining passages therethrough.

4,180,911

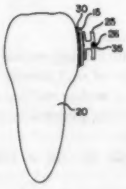
METHOD FOR DIRECT BONDING OF ORTHODONTIC STRUCTURES TO TEETH USING FLOURIDE PRETREATMENT

Richard S. Bullock, Chicago, Ill., assignor to Applied Science Corporation, Chicago, Ill.

Filed Sep. 16, 1977, Ser. No. 833,717

Int. Cl.[2] A61C *7/00*; C09K *3/00*

U.S. Cl. 433—9 **15 Claims**



1. The method of securing an orthodontic fixture to a tooth surface, comprising the steps of:

(a) cleaning said tooth surface of extraneous foreign matter,

(b) swabbing said tooth surface with a stannous fluoride solution and letting said solution remain on said tooth surface for approximately 120 seconds to prepare said tooth surface for the application of an adhesive by providing a bridging means on said tooth surface,

(c) rinsing excess stannous fluoride solution from said tooth surface, leaving said bridging means on said tooth surface,

(d) drying said tooth surface,

(e) combining a cyanoacrylate resin and a hydryphobic filler powder in a ratio for providing a desired cure time and viscosity,

(f) mixing said resin and said powder to form a homogenous adhesive,

(g) placing said adhesive on a side of said orthodontic fixture for engaging said tooth surface with said bridging means thereon,

(h) placing said side of said orthodontic fixture with said adhesive in a desired position on said tooth surface,

(i) applying pressure to said orthodontic fixture against said tooth surface, and retaining said orthodontic fixture in said desired position until said adhesive interacts with said bridging means and cures,

said fixture thereby being secured to said tooth surface in said desired position by a strong bond at a tooth surface interface with said fixture including said adhesive and said bridging means and capable of enduring long periods of time in an oral environment.

4,180,912

ORTHODONTIC LIGHT WIRE APPLIANCE

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Filed Sep. 22, 1978, Ser. No. 944,742

Int. Cl.[2] A61C *7/00*

U.S. Cl. 433—13 **18 Claims**

1. An orthodontic appliance for use in combination with a metal bracket having a body with an occlusogingivally extending opening, attaching flanges at the lingual side of the body, and a mesiodistally extending archwire slot opening gingivally at the gingivolingual corner of the body, said appliance comprising a body of plastic material capable of flexing for mounting same on a bracket, said body having means coacting with the bracket body for detachably securing the appliance to the bracket and means coacting with the archwire slot to retain an archwire therein, and said body having means to cover the labial surfaces of the bracket body and flanges and the mesial and distal surfaces of the bracket body so that substantially all of said surfaces are not visible from the labial.

4,180,913

α-CYANOACRYLATE DENTAL MATERIAL AND METHOD OF PREPARATION

Mitsuharu Takeuchi, No. 2-16-19, Ichikawa, Ichikawa-shi, Chiba-ken, Japan; Satoshi Hayashi, Odawara, and Isao Minemoto, Matsudo, both of Japan, assignors to Lion Hamigaki Kabushiki Kaisha and Mitsuharu Takeuchi, both of Tokyo, Japan

Filed Nov. 14, 1977, Ser. No. 851,080

Claims priority, application Japan, Nov. 13, 1976, 51/136782; Nov. 13, 1976, 51/136783

Int. Cl.[2] C08K *9/04*

U.S. Cl. 433—228 **22 Claims**

1. A filler for an α-cyanoacrylate dental material comprising a silica powder substrate having a particle size range of from about 1 to 100 millimicrons coated with at least one solid catalyst having a weak catalytic activity to said α-cyanoacrylate, said solid catalyst being at least one member selected from the group consisting of amino acids and acid-amide compounds, said filler capable of forming a thixotropic composition with said α-cyanoacrylate, and said thixotropic composition capable of being cured by polymerization reaction with a setter.

4,180,914

SELF-LOCKING TELESCOPIC EXTENSIBLE RULE

Helmut Lechner, Forellenweg 1, 3590 Bad Wildungen-Wega, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,215

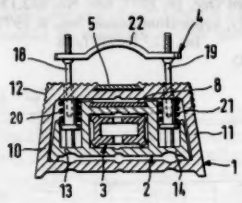
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725113

Int. Cl.[2] G01B *3/08*

U.S. Cl. 33—161 **5 Claims**

1. A length-measuring instrument comprising: at least two tubes extensible telescopically; fixing means acting in any position of said tubes; scale graduation means on each one of said tubes, the scale graduation means on an inner one of said tubes proceeding numerically in a direction opposite to the scale graduation means on an outer one of said tubes, said fixing means comprising automatic clamping means with two

spring-loaded clamping pins passing through said outer one of said tubes and arranged in an inclined position, said clamping pins resting in each fixed position of said tubes against an upper surface of said inner one of said tubes carrying said scale gradu-



ation means, release from clamping being attainable by applying external force to said clamping means for retraction of said inner one of said tubes, said inner one of said tubes being extendable without applying external force to release said clamping means.

4,180,915

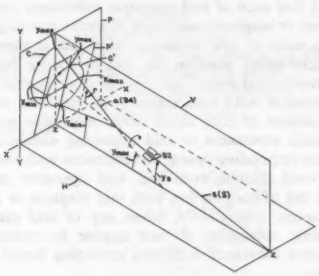
RUNOUT COMPENSATION IN VEHICLE WHEEL ALIGNMENT MEASURING APPARATUS

Melvin H. Lill, San Jose, and James L. Wiederrich, Lodi, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 23, 1978, Ser. No. 889,167

Int. Cl.² G01B *11/26*

U.S. Cl. 33—228 **14 Claims**



1. In a method of correcting for alignment measuring instrument runout error wherein the measuring instrument is installed on a vehicle wheel, said measuring instrument comprising a fixture that is detachably mounted on said wheel, sensor means on said fixture for detecting the angular inclination of said fixture, and signal means responsive to said sensor means for providing signals proportional to the angular inclination of said fixture in a selected alignment plane, said method comprising the obtaining of a fixture inclination signal from the signal means at a particular rotative position of the wheel, determining the runout error of the wheel at said rotative position of the wheel, and adding or subtracting a signal corresponding to said runout error from a fixture inclination signal at said rotative wheel position to obtain a true inclination signal for said wheel at said rotative position; the improvement comprising the steps of obtaining the fixture inclination signal from said signal means at a first rotative position of the wheel, rotating the wheel to a second position and obtaining the fixture inclination signal from said signal means at said second rotative position of the wheel, rotating the wheel to a third position and obtaining the fixture inclination signal from said signal means at said third rotative position of the wheel, and computing the runout error of the sensor means at said third rotative position based on said fixture inclination signals from the first, second and third rotative positions of the wheel.

4,180,916

GYROSCOPIC INSTRUMENTS

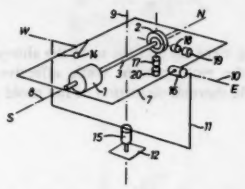
David L. Brook, Watford, England, assignor to S. G. Brown Limited, Watford, England, a part interest

Filed Jul. 25, 1977, Ser. No. 818,835

Claims priority, application United Kingdom, Jul. 23, 1976, 30933/76

Int. Cl.² G01C *19/28*

U.S. Cl. 33—318 **18 Claims**



1. A gyroscopic instrument comprising a stabilizing gyro having a rotor, a driving shaft, means rigidly mounting said stabilizing gyro rotor on said driving shaft against movement relative to said driving shaft, a control gyro having a rotor, means mounting said control gyro rotor on said driving shaft for limited tilting movement of the control gyro rotor through a small angle from coaxiality with said stabilizing gyro rotor, means for sensing said limited movement, and means responsive to the sensing of said limited movement to apply to said stabilizing gyro rotor a force to restore said coaxiality.

4,180,917

PROCESS FOR FREEZE-DRYING ENZYMES

Clifford E. Neubeck, Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 5, 1978, Ser. No. 939,745

Int. Cl.² F26B *5/06*

U.S. Cl. 34—5 **11 Claims**

1. A process for the preparation of freeze-dried enzyme compositions which comprises: concentrating a liquid enzyme solution by ultrafiltration; adding to said concentrate water-insoluble salts, and optionally suspenders and thickeners, to obtain a non-settling concentrate composition, and freeze-drying said concentrate composition at temperatures from about −78° C. to about 30° C. in vacuo.

4,180,918

MICROWAVE DRYING OF CERAMIC SHELL MOLDS

Richard C. Ostrowski, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1978, Ser. No. 949,324

Int. Cl.² F26B *7/00, 2/28*

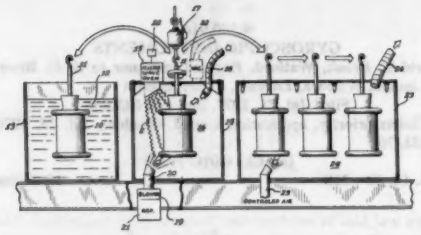
U.S. Cl. 34—13 **15 Claims**

1. A method of drying a refractory slurry layer deposited on a mold pattern (10) formed of a thermally fusible material having low heatability by subjection to microwave energy (E), to form a shell mold, comprising the steps of:

(a) subjecting the mold pattern (10) with the slurry layer thereon to microwave energy (E) sufficient to heat the refractory slurry;

(b) withdrawing a portion of the liquid phase of the heated slurry while concurrently cooling the slurry and mold pattern to maintain the mold pattern at a temperature

subjacent the fusion temperature of the mold pattern material; and



(c) repeating steps (a) and (b) until the slurry is effectively dried in the mold pattern while effectively preventing undesirable thermal distortion of the mold pattern.

4,180,919

METHOD FOR DRYING LAUNDRY, AND A DRYING CABINET FOR CARRYING OUT SUCH METHOD

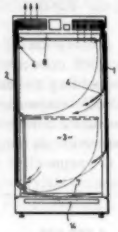
Hans Baltes, Heideweg 21a, 5841 Dortmund-Holzen, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,493

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646903; Jan. 7, 1977, 2700493; Feb. 8, 1977, 2705116

Int. Cl.² F26B *3/04*

U.S. Cl. 34—23 **6 Claims**



1. A method of drying flat material, such as laundry, hanging vertically in an interior of a cabinet, flowing heated air from one side of the interior of the cabinet and against the edges of said hanging material, exhausting a major portion of said flowing heated air in said cabinet interior from the lower portion at the opposite side of the interior of said cabinet and exhausting a smaller portion of said drying air from the upper portion at the opposite side of the interior of said cabinet, directing the exhausted warm air from said cabinet interior to a heat exchanger for exchanging part of its thermal energy within said heat exchanger to provide preheated air, heating the preheated air to a temperature for drying, and then flowing the heated drying air to said first side of said cabinet flowing into the interior thereof.

4,180,920

ARRANGEMENT TOY FOR SIGNALLING PROPER ARRANGEMENT OF ELEMENTS

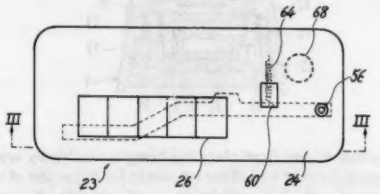
Morio Ubukata, and Hideki Kida, both of Tokyo, Japan, assignors to Alps Shoji Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,134

Claims priority, application Japan, Sep. 6, 1977, 52-106303

Int. Cl.² G09B *1/08*

U.S. Cl. 35—9 D **12 Claims**



1. An arrangement toy comprising:

(a) a plurality of arranging elements including magnets or magnetic substances located at their particular positions, respectively;

(b) an arrangement device having means for arrangement of said elements at pre-determined positions on the surface of an arranging board;

(c) discrimination means for discriminating the order of said arranging elements and comprising, a plurality of operative substances which operate in combination with said magnets or magnetic substances and are respectively provided at such positions on the underside of said arranging board that each of said operative substances oppose said magnet or magnetic substance of each arranging element when each of said arranging elements is placed at its pre-determined position on said arranging board in a pre-determined order, said operative substances being in cooperation with said magnets or magnetic substances independent of each other when respective magnets or magnetic substances in said arranging elements oppose said corresponding operative substances with said arranging board therebetween and, said operative substances being out of cooperation with said magnets or magnetic substances, respectively, when any of said magnets or magnetic substances do not oppose its corresponding operative substance with said arranging board therebetween;

(d) communication means for communicating the effect attained by said discrimination means; and

(e) notification means notifying the effect communicated by said communication means;

each of said operative substances of said discrimination means including an operative substance capable of sliding up and down in a cylinder;

and wherein, said operative substances comprise magnetic substances when said arranging elements comprise magnets, and said operative substances comprise magnets when said arranging elements comprise magnetic substances.

4,180,921

SPECTACLE FRAME SELECTOR AND DISPLAY DEVICE

Bernard M. Elbaum, Pittsford, and Engel Harvey, New York, both of N.Y., assignors to Textron, Inc., Rochester, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,391

Int. Cl.² G09B *25/00*

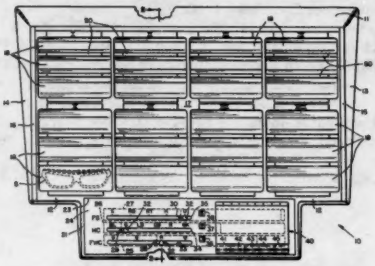
U.S. Cl. 35—59 **9 Claims**

1. A spectacle frame selector and display device, comprising a stand having thereon a spectacle frame display surface and a spectacle frame selector surface,

said display surface having therein a plurality of spaced recesses each of which is adapted to have a spectacle frame releasably seated therein for display purposes,

a first plurality of indicia on said display surface adjacent said recesses and identifying the particular types of spectacle frames seated in said recesses,

a plurality of selector members adjustably mounted on said stand adjacent one end of said selector surface for movement manually in accordance with particular physical



characteristics and/or fashion preferances of an individual into different selector positions in which said members provide information for use in selecting a frame, and

a frame selector index mounted on said selector surface adjacent the opposite end thereof and operable manually in accordance with the information derived from said selector members to disclose the indicia which identifies a particular one of said frames most suited cosmetically for said individual.

4,180,922

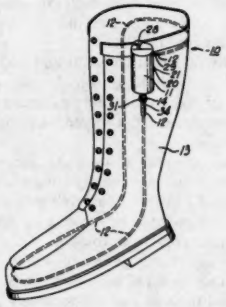
BOOT WARMER

Stanley Cieslak, 14, Creek Rd., and Leonard K. Cieslak, 14 Creek Rd., both of, McKees Rocks, Pa. 15136

Filed Feb. 7, 1978, Ser. No. 875,815

Int. Cl.[2] A43B *7/02*

U.S. Cl. 36—2.6 **3 Claims**



1. A footwear warmer comprising a portable compact heater unit including a compact insulated case having a cavity therein and adapted to be opened to receive slow burning solid fuel agglomerates in said cavity for combustion, a liquid reservoir in said case positioned for heat transfer from ignited fuel agglomerates in said cavity, a flexible liquid conduit having both ends thereof connected for circulation of the heated liquid from said reservoir through said conduit in a closed circuit adapted for circulation of heated liquid from said reservoir within a unit of footwear, pump means connected to said conduit for hand manipulation to circulate heated liquid from said reservoir through said conduit on demand, and means to secure said heater unit to a boot top with said pump manipulation means exposed for hand manipulation.

4,180,923

OUTSOLE FOR SPORT SHOES

Adolf Dassler, Kreuzgasse, D-8522 Herzogenaurach, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,484

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801964

Int. Cl.[2] A43B *13/04*

U.S. Cl. 36—32 R **15 Claims**

1. An outsole for a sports shoe comprising an outsole member of resilient material having a lower face, a plurality of profile projections projecting out of said lower face, said profile projections each comprising three to four elongate profile bodies having two ends, said profile bodies in each case being located close to one another at one end and diverging from one another from said one end and forming acute angles between their longitudinal axes, each acute angle having a value such that all profile bodies of each projection are disposed within a sector of less than 180°, each of the profile bodies tapering at least from its longitudinal center gradually towards its other end.

4,180,924

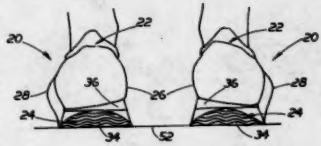
RUNNING SHOE WITH WEDGED SOLE

Steven I. Subotnick, Hayward, Calif., assignor to Brooks Shoe Manufacturing Co., Inc., Philadelphia, Pa.

Filed May 22, 1978, Ser. No. 908,344

Int. Cl.[2] A43B *5/00, 13/38*

U.S. Cl. 36—129 **6 Claims**



1. A pair of running shoes, each of said shoes comprising an upper portion and a sole, said upper portion having an inner side and an outer side, said sole running the length of the shoe from the heel to the toe between the inner and outer sides, said sole being formed of a resilient material and comprising a wedge portion extending the full length of the heel to a point

to the front of the arch of the wearer's foot and immediately to the rear of the first metatarsal head thereof, said wedge portion being canted upward in the transverse direction from the outer side of the shoe to the inner side of the shoe along the length of said wedge portion, so that when the wearer runs in said shoes a substantial portion of each sole makes contact with the ground during each step.

4,180,925

APPARATUS WITH MASKING MEANS FOR CONTINUOUSLY COVERING A SLOT THEREIN

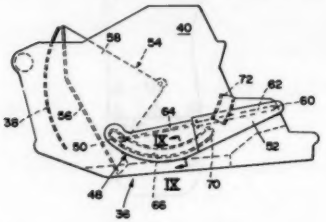
Warner G. Richardson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 786,180, Apr. 11, 1977, Pat. No. 4,109,400. This application Mar. 6, 1978, Ser. No. 884,080

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.[2] E02F 9/28

U.S. Cl. 37—126 AE **7 Claims**



1. An apparatus comprising

a first sidewall of a bowl assembly,

a second sidewall of a bowl portion movably mounted in said bowl assembly for movement between first and second positions thereon,

actuating means at least substantially disposed on a side of said first sidewall for selectively moving said second sidewall between its first and second positions, said actuating means connected to said second sidewall through an elongated slot formed through said first sidewall, and

masking means for continuously covering said slot upon actuating of said actuating means when said second sidewall is moved between its first and second positions.

4,180,926

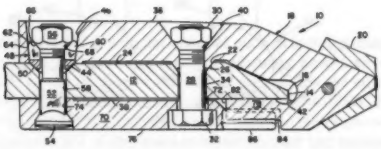
LOAD ABSORBING MEANS FOR CUTTING EDGE ASSEMBLY

Gene R. Klett, and William E. Lanz, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 3, 1978, Ser. No. 874,725

Int. Cl.[2] E02F 9/28

U.S. Cl. 37—142 R **16 Claims**



1. In a tooth mounting assembly for an earthworking implement which comprises a support plate having a cutting edge along a front side thereof and an adaptor for an earthworking tooth attached to said support plate and extending forwardly past said cutting edge, an improvement comprising:

a first conical seat formed in a top of said support plate;

a first conical taper extending downwardly from said adaptor; and

means for fastening said seat in mating supportive contact with said taper.

4,180,927

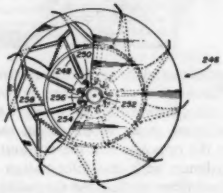
DIGGING BUCKET CYLINDER POWERED EJECTOR SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 745,860, Nov. 29, 1976, Pat. No. 4,157,623, which is a division of Ser. No. 660,515, Feb. 23, 1976, Pat. No. 4,062,562, which is a continuation of Ser. No. 554,671, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 400,043, Sep. 24, 1973, Pat. No. 3,897,109, which is a continuation-in-part of Ser. No. 238,089, Mar. 28, 1972, abandoned. This application May 10, 1978, Ser. No. 904,385

Int. Cl.[2] E02F 3/24

U.S. Cl. 37—190 **1 Claim**



1. An excavating wheel comprising:

a pair of spaced apart side plates mounted for rotation about and each extending radially outwardly with respect to a central axis of rotation;

a plurality of stationary walls each extending between the side plates and each having outwardly projecting material cutting means;

said stationary walls being stationary with respect to the side plates;

a plurality of movable walls each extending between the side plates for cooperation with one of the stationary walls to define a digging bucket;

said plurality of stationary walls and said plurality of movable walls cooperating with the side plates to define a plurality of digging buckets positioned immediately adjacent one another about the entire periphery of the excavating wheel;

each of said movable walls being supported by the side plates for pivotal movement between a material receiving position and a material dumping position;

means entirely enclosed by the digging buckets and the side plates and responsive to rotation of the excavating wheel for positively pivoting the movable wall of each digging bucket to the material receiving position during one portion of said rotation and for positively pivoting the movable wall of each digging bucket to the material dumping position during another portion of said rotation; and

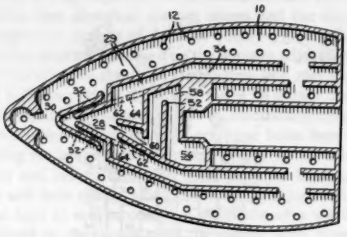
said means for positively pivoting the movable wall of each digging bucket comprising:

a plurality of cylinders each connected to one of the movable walls for selective actuation under fluid pressure to pivot each movable wall to the material dumping position;

valve means for controlling the actuation of the cylinders in accordance with the rotational positioning of the digging buckets; and

a plurality of springs each connected to one of the movable walls for pivoting each movable wall to the material receiving position.

4,180,928
SELF-CLEAN STEAM IRON
William E. Davidson, Ontario, Calif., assignor to General Electric Company, New York, N.Y.
Filed Jul. 17, 1978, Ser. No. 925,060
Int. Cl.[2] D06F *75/06*
U.S. Cl. 38—77.83 **6 Claims**

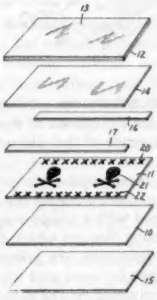


1. In a steam iron with a water tank above an electrically heated soleplate with apertures therein, a primary steam generator in said soleplate fed from said tank by a water valve for steam generation, a coverplate over said soleplate forming distributing passages connecting said primary generator with said apertures, a separate surge generator fed by a surge valve for intermittent steam generation, a duct connecting said surge generator in upstream flow series relation so surge steam flows through said duct into said primary generator and thence through said distributing passages to said apertures for a surge of steam, the improvement comprising,

converging nozzle means in said duct,

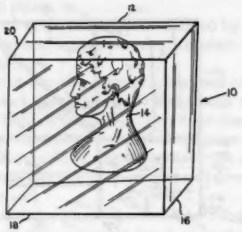
said nozzle increasing the surge steam velocity into said primary generator to scrub said generator before entering the distribution passages to said apertures.

4,180,929
TAMPER INDICATING LABEL
Thomas E. Schultz, Jr., Lakeland, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 23, 1978, Ser. No. 871,361
Int. Cl.[2] G09F *3/02*
U.S. Cl. 40—2.2 **10 Claims**



1. A laminate especially suited as a tamper indicating label consisting essentially of (a) first and second polymeric plies, said first polymeric ply being substantially transparent and having a tensile strength at least 40% greater than said second polymeric ply, (b) first and second tacky and cohesive pressure sensitive adhesive layers, (c) first and second sets of indicia printed on said second polymeric ply, (d) masking coating over said first set of indicia but not over said second set of indicia and (e) a transparent or tinted polymeric coating over said masking coating, said second set of indicia and said second polymeric ply, said polymeric coating having low adhesivity to said first pressure sensitive adhesive layer, said second set of indicia and one of said masking coating and said first set of indicia having substantially greater adhesivity to said second polymeric ply than the other of said masking coating and said first set of indicia whereby before tampering said second set of indicia is fully visible and said first set of indicia is not visible when said laminate is adhesively attached to a substrate by said second pressure sensitive adhesive layer and tampering reveals said second polymeric ply bearing fully visible both said first set of indicia and said second set of indicia.

4,180,930
REFLECTED THREE DIMENSIONAL DISPLAY
Paul DiMatteo, Melville, N.Y., assignor to Solid Photography Inc., Melville, N.Y.
Filed Aug. 19, 1977, Ser. No. 825,952
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—160 **8 Claims**



1. A display device comprising: means having a reflective surface; half of a symmetrical object mounted on said reflective surface, said reflective surface being in the plane of symmetry of said symmetrical object so that when said half of the object is viewed together with reflections of said half from said reflective surface two symmetrical halves of said object may be seen simultaneously; said means having a reflective surface comprises a block of transparent material, said reflective surface being on the backside of said block, said reflective surface being viewed from the front side of said block and through the thickness of said block; said half of said symmetrical object being in direct contact with said block of transparent material so that said contact is free of an air space between half of said object and said block, said block applying refractions to reflections from said half of said object and from said reflective surface so that a predetermined view is obtained dependent on the direction from which said half of said object is viewed; said predetermined view in size and shape being also dependent on the shape of said block of transparent material, said block having a back side and a front side, said back side being inclined at a substantial angle with respect to the front side of said block.

4,180,931
DISPLAY DEVICE
John V. Osch, 3415 S. Honey Creek Ct., Milwaukee, Wis. 53219
Filed Oct. 11, 1977, Ser. No. 840,825
Int. Cl.[2] G09F *13/12*
U.S. Cl. 40—219 **18 Claims**

1. A display device comprising

a housing having a viewing opening, a first display compartment substantially aligned with said viewing opening and a second display compartment disposed at substantially a right angle to said first display compartment;

a light transmitting mirror located inside said housing between said viewing opening and said display compart-

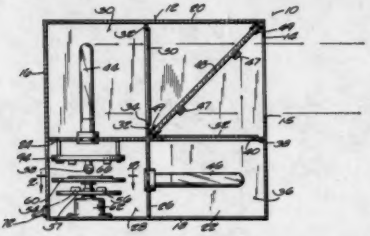
ments and disposed at an angular relationship with said display compartments;

illuminating means in each of said display compartments for transmitting light toward said mirror;

a display transparency bearing indicia disposed in each of said display compartments between the respective illuminating means and said mirror; and

control means for sequentially and alternately brightening one of said illuminating means while simultaneously dimming the other of said illuminating means so as to cause the indicia on both of said display transparencies to merge and alternate when viewed through said viewing opening, said control means comprising

electrical circuit means interconnecting said illuminating means with a source of electrical power, said circuit means including first and second voltage controls, each electrically interconnected between one of said illuminating means and said power source, and further including first and second photosensitive devices, each electrically connected to one of said voltage controls for



regulating the voltage supplied through the respective voltage control to the respective illuminating means in response to the amount of light falling thereon,

a light source adapted to emit light onto both of said photosensitive devices,

light interrupting means interposed and mounted for cyclic movement relative to said light source and said photosensitive devices, said light interrupting means comprising an opaque element including a single window portion which is adapted to sequentially and alternately gradually vary the amount of light from said light source falling on each of said photosensitive devices during one portion of the cyclic movement of said element and is further adapted to block the light from falling on one of said photosensitive devices while permitting substantially the full amount of the light to fall on the other of said photosensitive devices during other portions of the cyclic movement of said element, and

drive means for moving said element through a repeating cycle.

4,180,932

ANIMATED PLANT DISPLAY

Irving I. Millard, 46-27 157th St., Flushing, N.Y. 11355

Filed May 12, 1976, Ser. No. 685,506

Int. Cl.[2] A63H *13/20*

U.S. Cl. 40—455 **6 Claims**

1. An animated animal, comprising:

a body attached to a wire,

a lateral support attached across a portion of the body,

a pair of wings each resting on an upwardly bent edge of the lateral support,

a plurality of wires each attached at an end to one of the wings and at another end to the other wing, whereby the wings may flutter when moved without falling down,

the wire supporting the animal forming a slight bend near an upper end of the wire, and two right angle bends near a lower end of the wire,

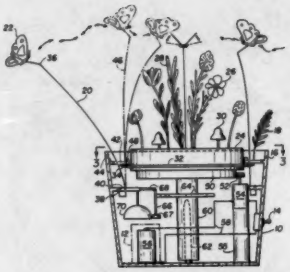
a housing forming an internal support,

the lower end of the wire upwardly inserted in the support in the housing,

a slot formed in the support through which the wire passes,

a shaft rotatably mounted in the housing,

a cog wheel concentrically mounted on the shaft,



a collar mounted near an upper end of the housing around the platform and forming a slot through which the wire passes,

a stop attached to a proximal end of the slot in the collar, and

a cog on the cog wheel resiliently displacing the wire as the cog passes the wire, thereby causing the animal to undulate.

4,180,933

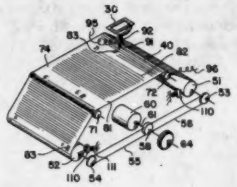
ELECTRIC DICTIONARY

Georges A. Chammah, 100 Cote-Vertu, Apt. 1010, St. Laurent, Canada (P.Q. H4N1C7)

Filed Aug. 5, 1977, Ser. No. 822,077

Int. Cl.[2] G09F *11/22*

U.S. Cl. 40—471 **3 Claims**



1. An electrical dictionary comprising

a tape on which the definitions of words are printed in the alphabetical sequence of the said words in a given direction along said tape,

a housing in which each end of the tape is mounted on one of two spaced parallel wind-up rollers,

said housing formed with a window opening in the exterior face of said housing through which the surface of the tape, on which the definitions are printed, is displayed for a section of the tape between said wind-up rollers,

a cursor slidably mounted on the exterior face of said housing in a slot in the housing oriented perpendicular to the direction of travel of the tape, said cursor fitted to first electrical contact means in said housing,

an idler roller, the surface of which is electrically conductive, mounted under the tape in a position to be contacted by said first electrical contact means when the first electrical contact means is not separated from the idler roller surface by a solid section of tape on said roller, between the said first electrical contact means and the idler roller,

motorized means to drive said tape so as to wind upon a first wind up roller and unwind upon the second wind up

roller, said motorized means of a reversible nature, with the direction thereof controlled by a reversing switch mounted to the housing,

electrical circuitry means responsive to a start switch mounted on said housing which causes the motorized means to continuously rotate, once actuated by said start switch, and electrical means which causes said motorized means to stop responsive to electrical contact between the cursor first electrical contact means and the electrically conductive surface of the idler roller, with a plurality of indicia externally marked on the housing adjacent the path of travel of the cursor in the housing slot, and a plurality of holes in said tape, each of a size to permit the cursor first electrical contact means to electrically contact the idler roller surface, each of said tape holes been located along the lateral axis of the tape to correspond to a particular said indicia externally marked on the housing, with

each said hole spaced along the axis of the path of travel of the tape to correspond to a definition of a word that is related to the position of the cursor with regard to a particular indicia.

4,180,934

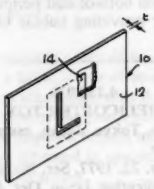
PERFORATED STENCIL SIGN PANEL

Seymour Cohen, 9629 Cresta Dr., Los Angeles, Calif. 90035

Filed Apr. 12, 1977, Ser. No. 786,794

Int. Cl.[2] G09F *13/05*

U.S. Cl. 40—580 **3 Claims**



1. A display device for displaying at least word forming letters on a substantially flat surface comprising:

a sheet of a flexible rollable material, said sheet having a front surface and a back surface, said sheet being opaque over said front surface except for preselected letter-shaped areas through which light is adapted to pass from said back surface to said front surface; and

means for tauting said sheet about its entire periphery to flatten it and its front surface, so that said areas through which light is adapted to pass are taut and flat to facilitate the passage of light therethrough, said sheet being of semitransparent matter of at least a first color, said sheets front surface except for the letter-shaped areas being coated with coating matter of a selected second color contrasting said first color, which substantially inhibits the passage of light therethrough, with the letter-shaped areas ' eing of said first color, whereby when light passes from the sheet's back surface to the front surface through said areas, the latter are illuminated areas in said first color, said sheet defining a plurality of pocket-like members extending along the entire periphery of the sheet's back surface, and said tauting means include a plurality of separate interlockable members, which are insertable into said pocket-like members, for forming a continuous frame to taut said sheet thereon.

4,180,935

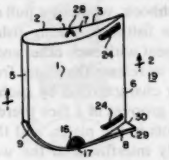
HYDROFOIL TRAWL DOOR

Clifford A. Goudey, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 29, 1977, Ser. No. 828,486

Int. Cl.[2] A01K *73/02*

U.S. Cl. 43—9 **33 Claims**



1. A trawl door with a hydrofoil cross-section comprising:

a plurality of connected substantially rectangular first, second, and third plates,

the cross-sectional shape of said door defined by a plurality of curved sections of said plates, the first plate of which is convex outward,

the second plate is concave outward, one end of each first and second plate being joined at their ends to form an acute angle at the trailing edge of said door, the third plate is convex outward and at one of its ends joins the second plate at its remaining end, the tangents of the second and third plates coinciding at their juncture to form a smooth point of inflection;

a pipe, the remaining ends of the first and third plates are joined with said pipe, whose radius is at least an order of magnitude smaller than the radius of said first and second plates, to form a convex arc such that the tangents of the first and third plates when they are joined to the pipe form a fair surface with said pipe, said pipe arc forming the leading edge of said door,

said assembly of first, second, and third plates and pipe having a cross-section in the form of a hydrofoil having high lift and low drag,

a first and second end plate, the unconnected ends of said first, second, and third plates and said pipe ends being attached to said end plates,

one of said end plates being substantially heavier than the other to form the bottom of said door,

at least one opening in said door near its bottom being so constructed as to allow water to enter and exit the interior of said door.

4,180,936

FISHING LURE

Lester M. Davis, 10805 36 NW., Gig Harbor, Wash. 98335

Filed Mar. 23, 1978, Ser. No. 889,227

Int. Cl.[2] A01K *85/04*

U.S. Cl. 43—42.5 **1 Claim**

1. A fishing lure comprising two slidingly interfitted and intersecting plates of elliptical shape in plan, forming a cross in section and with the plates disposed at substantially right angles to each other and with the forward end portions and the

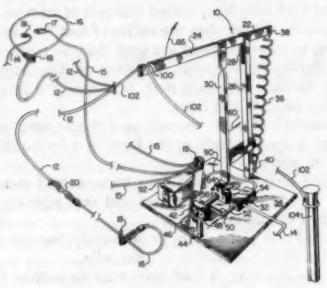
rearward end portions, respectively, aligned, said plates comprising separate plates, one thereof having a slot extending from its forward end portion and along its major axis and to a mid portion thereof and having means, disposed in its forward end portion, for engagement with a fishing line, and the other thereof having a slot extending from its rearward end portion and along its major axis and to a mid portion thereof and having means, disposed in its rearward end portion, for engagement with a fishhook, whereby a pull exerted between the fishing line and the fishhook, during fishing, urges the two plates into engagement with each other and a pull in the opposite direction tends to release the plates from each other, said plates being further characterized by each thereof being provided with parallel grooves in a face thereof, the grooves are aligned with the slots in the plates, and the slot in one plate slidingly and snugly interfits with the walls of the aligned grooves in the other plate.

4,180,937

ELECTRICAL ANIMAL SNARE

Jady Webster, 339 W. College, Lewisville, Tex. 75067

Filed Jun. 1, 1978, Ser. No. 911,436
Int. Cl.[2] A01M *23/00*
U.S. Cl. 43—87 **9 Claims**



1. An animal trap apparatus of the type including a filament snare being spring actuated to ensnare the animal in the vicinity of bait disposed relative thereto, wherein the apparatus contains:

a trigger mechanism having a snaring lever arm pivoted for movement in response to the detection of an animal;

spring means biasing said trigger mechanism for responsive movement in conjunction with a filament snare;

latch means maintaining said biased trigger mechanism in a loaded condition;

means connecting said filament snare to said trigger mechanism for movement in reaction to said latch means and for permitting said filament snare to be disengaged therefrom after the actuation of said trigger;

solenoid means disposed adjacent said latch means for actuating said latch to permit said spring to activate said lever arm for engaging the animal relative thereto;

electrical sensor means disposed adjacent said snare for detecting the presence of an animal in position for ensnarement; and

means for supplying electric power to said solenoid means and said sensor means for the actuation of said trigger mechanism.

4,180,938

BUBBLE BLOWING WAND

La Fata, John E., 3240 Sunset La., Oxnard, Calif. 93030, and John D. Cuccio, 808 N. Signal St., Ojai, Calif. 93023

Filed Oct. 17, 1977, Ser. No. 842,664
Int. Cl.[2] A63H *33/28*
U.S. Cl. 46—6 **10 Claims**

1. A bubble blowing wand for purposes of blowing a bubble or bubbles within a bubble comprising:

a handle;

a first member defining a peripheral surface attached to said handle;

a second member defining a like peripheral surface area spaced interiorly of said first member substantially in the same plane therewith and connected thereto by a stem wherein said space between said first and second members extends between them respectively except where said stem connects them; and,

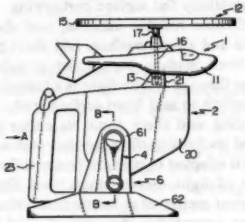
a relieved surface on both of said peripheral surfaces defining members for providing bubble blowing fluid on the surfaces thereof.

4,180,939

HELICOPTER TOY

Yukimitsu Matsushiro, Tokyo, Japan, assignor to K.K. Matsushiro, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,913
Claims priority, application Japan, Oct. 4, 1977, 52/132833
Int. Cl.[2] A63H *27/12*
U.S. Cl. 46—75 **9 Claims**



1. A helicopter toy comprising, in combination, a toy helicopter and a launcher therefor, said helicopter including a lift rotor and a drive shaft connected thereto and said launcher comprising a housing and a driving apparatus accommodated therein and having an output shaft for driving engagement with said drive shaft to couple the driving apparatus with the lift rotor and thereby bring about rotation thereof, said driving apparatus comprising an elongate driving cylinder mounted rotatably within the housing and having two end portions and an intermediate portion and formed integrally with an externally toothed wheel at said intermediate portion, drive means

to bring about rotation of said driving cylinder, a large gear wheel mounted on said driving cylinder and having an annular portion which has an inner periphery and an outer periphery and surrounds said externally toothed wheel and is provided at its inner periphery with teeth which engage the teeth of said externally toothed wheel and connect said large gear wheel drivingly with said externally toothed wheel, said large gear wheel being toothed at its external periphery; and the driving apparatus further comprising a second gear wheel, provided on said output shaft, and gearing connecting the teeth at the external periphery of said large gear wheel drivingly with said second gear wheel.

4,180,940
GRAVITY ACTUATED TOY DEVICE
Walter E. McMasters, 801 Elbert St., Defiance, Ohio 43512
Filed Sep. 11, 1978, Ser. No. 941,409
Int. Cl.[2] A63H *19/00*
U.S. Cl. 46—216 **7 Claims**

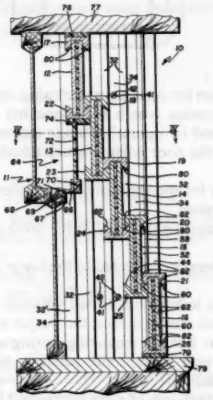
1. A toy device comprising a pair of handles; a substantially flat spring formed in a helix, a pair of attachment plates connected respectively to each handle with the ends of the spring attached between the connecting plates and handles; a movable element having rollers disposed therein movably engaging the spring with the rollers disposed in spaced relation above and below the material of the spring.

4,180,941
BEAN SPROUTER
Joe Korematsu, 14111Washington Ave., San Leandro, Calif. 94578
Filed Nov. 28, 1977, Ser. No. 854,971
Int. Cl.[2] A01C *1/00*
U.S. Cl. 47—14 **11 Claims**

1. A sprouter for beans and the like comprising:
a. cannister having a water tight bottom and a water collection area at the bottom of said cannister;
b. a cannister for beans and the like having a water draining bottom allowing water to pass through said container for accumulation and storage at the bottom of the water collection area;
c. support means for supporting said container on said cannister above said water collection area;
d. a top, covering said bean container for providing a dark environment for said beans in said container, said top having a concave dish portion with a plurality of uniformly spaced, open, water-passage holes in said dish portion passing through said top, said dish portion comprising a funnel-like temporary water collector for distributing water poured into said dish portion through said holes and over said bean container; and
e. a ventilation means comprising at least one air passage through said cannister from the water collection area to the atmosphere, said air passage being located below the bottom of said bean container for venting accumulating

carbon dioxide in the water collection area to the atmosphere.

4,180,942
WINDOW INSULATION
Ernest Saucier, 143 Merriam Ave., Leominster, Mass. 01543
Filed Jul. 31, 1978, Ser. No. 929,672
Int. Cl.[2] E05D *15/26*
U.S. Cl. 49—125 **13 Claims**



1. Window insulating apparatus, comprising:
(a) a plurality of panels formed of low heat-transfer material, the sum of the areas of the panels being approximately equal to that of the window opening, each panel being generally rectangular and being arranged in the window opening with the length extending horizontally, the panels being arranged in side-by-side planes and slidable vertically from an upper storage position where the panels lie side-by-side to an operative position where the panels are arranged in a step-like condition,
(b) an extruded element applied to the upper and lower edges of each panel, each element having a sealing surface which mates with a similar sealing surface on an extruded element applied to the immediately adjacent panel,
(c) a pair of side frame members having vertically extending

guiding elements for guiding the panels between the upper storage position and the lower operative position,

(d) first adjusting means for moving the side frame members toward and away from each other, and

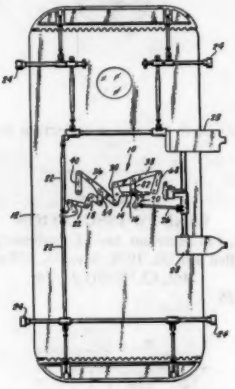
(e) second adjusting means for moving the vertically extending guiding elements for the outermost panel in a direction transverse to the plane of the window to maintain the desired degree of sliding friction for the outermost panel.

4,180,943

DUAL LOST MOTION MECHANISM FOR AN AIRCRAFT DOOR

Hugh D. Smith, Huntington Beach, and David M. Blackmore, La Palma, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 15, 1978, Ser. No. 942,879
Int. Cl.[2] E05F *11/54*
U.S. Cl. 49—279 **5 Claims**



1. A mechanism for opening and closing an aircraft door by operating latch means which are connected to latch and unlatch the door and by operating hinge means which are connected to rotate the door when it is unlatched, said mechanism including:

an input crank for the application of rotational movement to said mechanism;

latch output means connected to the latch means to operate them;

hinge output means connected to the hinge means to operate them;

a first four-bar linkage connected between said input crank and said latch output means, the output movement of said first four-bar linkage occurring during a first portion of rotation of said input crank rotation, said first four-bar linkage including:

a latch input crank arm of a predetermined length connected to said input crank to rotate therewith;

a latch idler crank arm of predetermined length pivotally connected to structure;

a latch link bar connected between said latch input crank arm and said latch idler crank arm, said latch link bar having at least one point therealong which moves in a generally circular path for said second portion of input crank rotation and a non-circular path during said first portion of said input crank rotation; and

a latch output link connected between said latch link bar point and said latch output means to produce output motion thereof when said latch link bar point is moving along said non-circular path, and;

a second four-bar linkage connected between said input crank and said hinge output means, the output movement of said second four-bar linkage occuring during a second portion of rotation of said input crank rotation, said second four-bar linkage including:

a hinge input crank arm of a predetermined length connected to said input crank to rotate therewith;

a hinge idler crank arm of predetermined length pivotally connected to structure;

a hinge link bar connected between said hinge input crank arm and said hinge idler crank arm, said hinge link bar having at least one point therealong which moves in a generally circular path for said first portion of input crank rotation and a non-circular path during said second portion of said input crank rotation; and

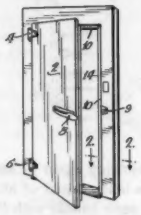
a hinge output link connected between said hinge link bar point and said hinge output means to produce output motion thereof when said hinge link bar point is moving along said non-circular path, said first and second portions of said input crank rotation each being about 90° of input crank rotation.

4,180,944

DOOR JAMB ASSEMBLY

William J. Stowik, Hudson, and Kenneth L. Kaiser, North Hudson, both of Wis., assignors to The Vollrath Company, Sheboygan, Wis.

Filed Nov. 3, 1978, Ser. No. 956,359
Int. Cl.[2] E06B *1/04*
U.S. Cl. 49—504 **4 Claims**



1. A jamb assembly for a door having a sealing gasket closing off a sealed low temperature compartment comprising a plurality of elongated door jamb members, each of said jamb members having a generally T-shaped configuration in which a leg of said jamb and its adjacent surfaces are constructed of a reinforced fiberglass material and the majority of the balance thereof is a foam material, said jamb leg including an exposed surface positioned to be contacted by the door in its closed position, the assembly further includes an isolated heat strip assembly consisting of a metallic enclosure disposed within the recess of said exposed surface with the outer surface of said enclosure being flush with the exposed surface of said leg, means securing said metallic enclosure to said leg, a heater wire requiring very low wattage extending through said enclosure, said heater wire serving to aid in maintaining the sealing relationship between the door and jamb assembly and at the same time to eliminate any chance of frost buildup on the jamb due to outside air leakage, and strap means for maintaining said door jamb members in a rigid, dimensionally stable frame, which strap means are disposed around the inner surfaces of said fiberglass material.

4,180,945

HONING MACHINE

Philip R. Zimmerman, 295 Berkeley Pk. Blvd., Kensington, Calif. 94707

Filed Nov. 2, 1977, Ser. No. 847,830
Int. Cl.[2] B24B *33/02*; B23B *47/00*
U.S. Cl. 51—34 C **10 Claims**

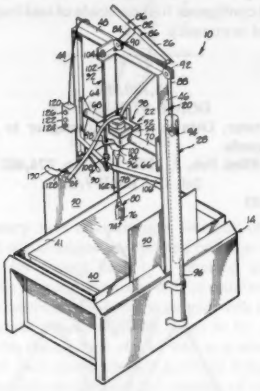
2. A honing machine for close tolerance sizing of a cylindrical bore in a work piece, comprising

table means having a horizontal surface for supporting the work piece with the axis of its cylindrical bore in vertical alignment,

a vertical column including two vertical rails arranged on opposite sides of the horizontal surface of the table means with a crosspiece spanning the vertical rails substantially above the horizontal surface of the table, the vertical column thereby forming an open passthrough above the table means,

a trolley arranged for vertical movement upon the vertical rails of the column,

a honing head and interconnected motor means for driving the honing head in rotation, the honing head including gimbal means for enabling it to be self aligning within the cylindrical bore of the work piece,



gimbal means mounting the motor means upon the trolley for suspending the honing head in general alignment with the cylindrical bore of the work piece, the gimbal means in the honing head and the gimbal means mounting the motor means upon the trolley permitting the honing head to be self aligning within the cylindrical bore,

the gimbal means for supporting the motor means upon the trolley including a first collar secured to the trolley, a second inner collar being pivotally supported from the first collar, the motor means being pivotally supported from the second inner collar in perpendicular relation to the pivotal connection between the first and second collars,

means for reciprocally moving the trolley upon the vertical rails in order to move the honing head through the length of the cylindrical bore.

4,180,946

TOOL HOLDING SPINDLE ASSEMBLY PARTICULARLY FOR A GRINDING MACHINE

Mats C. D. Heijkenskjold; Olle (Olof) J. G. Hedberg; Vello Klaassen; Sture V. Larsson, all of Lidkoping, Sweden (S-53101); Helmut Habermann, 2 allee principale, and Maurice Brunet, 41 quai Camere, both of 27200 Vernon, France

Continuation-in-part of Ser. No. 726,785, Sep. 27, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,213
Claims priority, application France, Oct. 2, 1975, 75 30209
Int. Cl.[2] B24B *5/00*
U.S. Cl. 51—134.5 R **11 Claims**

1. A tool-holding spindle assembly, particularly for a grinding machine, comprising:

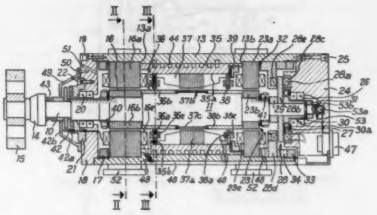
a power drive, for rotating the spindle,

at least one electromagnetic radial bearing having excitation coils, an annular armature mounted on the shaft of the spindle and a fixed armature surrounding this annular armature,

at least one electromagnetic axial bearing having a disc-shaped armature mounted on the shaft of the spindle and a fixed armature,

at least one radial position detector comprising two pairs of detecting units disposed along two different radial directions for delivering signals representative of the radial position of the spindle,

at least one axial position detector delivering a signal representative of the axial position of the spindle,



a control chain for controlling the radial and axial position of the spindle, said control chain being connected to said radial and axial detectors for receiving said signals delivered thereby, and said control chain being connected to excitation coils of the armatures of each magnetic bearing, for controlling the position of the spindle in response to said signals,

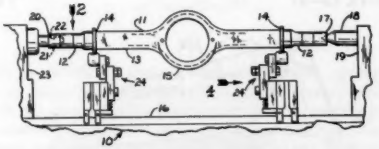
and means for selectively modifying at least one of the signals delivered by said detectors and thereby varying the reference position of the spindle for machining purposes, said signal modifying means being connected between said detectors and said control chain.

4,180,947

GRINDING METHOD

Dieter H. Schmidt, Terrace Park, and Dean H. Garman, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 9, 1978, Ser. No. 868,108
Int. Cl.[2] B24B *1/00, 5/14*
U.S. Cl. 51—326 **6 Claims**



5. A method of grinding a vehicle rear axle housing, comprising the following steps:

(a) supporting both ends of the housing in axial and radial directions;

(b) rotating the housing from one end;

(c) grinding one of opposite end grind diameters with a rotating grinding wheel; and

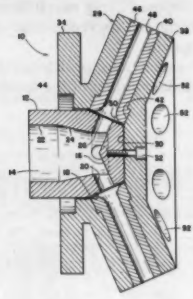
(d) supporting inboard tooling diameters with independent resilient floating support means substantially opposing gravitational sag of said housing while grinding.

4,180,948

INTERNAL PIPELINE CLEANING DEVICE

Woodrow W. Stoltz, P.O. Box 35103, Tulsa, Okla. 74135

Filed Jul. 15, 1977, Ser. No. 815,906
Int. Cl.[2] B24C *3/16*
U.S. Cl. 51—411 6 Claims



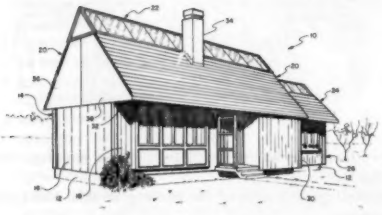
1. An internal pipeline cleaning device for use in combination with a power source having a hollow drive shaft in communication with a supply of abrasive grit materials and comprising hub means having an internal chamber in communication with the interior of the hollow drive shaft for receiving the abrasive materials therefrom, outer housing means secured to the hub means for simultaneous movement therewith, means provided on the outer housing means for securing the outer housing to the hollow drive shaft for rotation thereby, complementary radial passageway means provided in the hub means and outer housing means having one end in communication with the exterior of the outer housing in the proximity of one end thereof, said radial passageway means being disposed at an angle with respect to the perpendicular of the longitudinal axis of the hub means whereby upon rotation of the hollow drive shaft the abrasive materials will be thrown outwardly through the radial passageways from the internal chamber by centrifugal force in a combined angular and longitudinal direction away from the device for impinging against the inner periphery of the pipeline at an angle with respect to the perpendicular of the longitudinal axis of the pipeline and at a point spaced from the device.

4,180,949

TRANSPORTABLE-EXPANDABLE MOBILE HOME STRUCTURE

Earle S. Draper, Jr., 2020 Randolph Rd., Charlotte, N.C. 28207

Filed Jul. 7, 1978, Ser. No. 922,632
Int. Cl.[2] E04B *1/344;* B06P *3/34*
U.S. Cl. 52—67 7 Claims



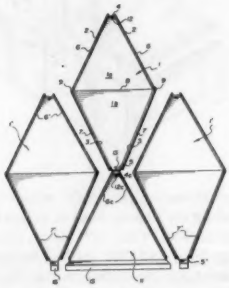
1. A mobile home for retracted transport and expanded occupancy, said mobile home including a body portion of highway-transportable width and having side walls and end walls surmounted by a roof structure, said roof structure including two roof portions, each roof portion having a first element mounted for transverse movement with respect to said body portion between a retracted position at which an extending end thereof is adjacent said walls of said body portion and an extended position at which said extending end thereof is outwardly beyond said side walls to form an eave, and having a second element pivotably connected at one end thereof to said first element adjacent said extending end thereof, said second element being arranged for pivotal movement between a first position folded in an overlapping relation to lie generally flat across said body portion at said retracted position of said first element and a second position at which the other, extending, ends of said second elements are joined to one another at a location spaced above said body portion to form a raised roof configuration at said extended positions of said fist elements, said mobile home additionally including at least one expansion unit selectively mounted beneath one said eaves of said roof structure and contiguous to the outside of said body portion for said expanded occupancy.

4,180,950

DOME STRUCTURE

Wilbert J. Foster, Ottawa, Canada, assignor to Annan Blair, Ottawa, Canada

Filed Feb. 2, 1978, Ser. No. 874,403
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—81 9 Claims



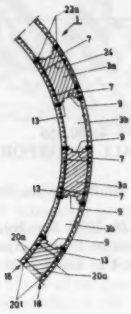
1. A building unit comprising a panel of quadrilateral shape having an outwardly facing surface, a first pair of adjacent edges of equal length and converging towards a first apex of the panel, a second pair of adjacent edges also of equal length and converging towards a second opposite apex of the panel, four upstanding walls connected to and extending the length of the four edges of said panel, the walls which are upstanding from said first pair of edges being simple flanges extending upwardly on the same side of the panel as said outwardly facing surface and generally perpendicular thereto, and the walls which are upstanding from said second pair of edges being, in cross-section, inverted U-shaped flanges comprising an upstanding flange which extends upwardly on the same side of the panel as the outwardly facing surface, and generally perpendicular thereto, and which turns outwardly, away from the panel and downwardly to form a U-shaped channel having a recess constructed to receive a said simple flange of another similar panel, said apices of said panel being truncated such that the ends of the pairs of flanges converging to the apices are spaced apart, such that a plurality of such units can be assembled together in successive horizontal courses to form a wall wherein the inverted U-shaped flanges of one panel in a first course are engagable with the simple flanges of contiguous units in a second lower course and such that said second truncated apex of said one panel in the first course over-laps said first truncated apex of a panel in a third lower course.

4,180,951

MASONRY WALL, METHOD FOR ITS PRODUCTION, AND ITS USE

Willi Francioni, Brugg, Switzerland, assignor to Gesellschaft zur Forderung der Forschung an der Eidg. Hochschule Techn., Zurich, Switzerland

Filed Dec. 5, 1977, Ser. No. 857,265
Claims priority, application Switzerland, Jul. 5, 1977, 8225/77
Int. Cl.[2] E04C *2/00*
U.S. Cl. 52—100 **37 Claims**



1. A masonry wall comprising a plurality of building elements which are arranged in rows and columns and reinforcement means for joining each of a selected number of said elements to its adjacent elements and for reinforcing said wall, said reinforcement means being arranged with respect to said selected number of said elements so as to be accessible and severable from the exterior of said wall at predetermined portions thereof, said predetermined portions being arranged so that each element of said selected number of said elements is selectively removable from said wall, either individually or as part of a selected group of said elements.

4,180,952

ANCHORING SYSTEM

Donald Vanderlyn, Burger Rd., West Shokan, N.Y. 12494

Filed Mar. 2, 1978, Ser. No. 882,579
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] E04H *12/20*
U.S. Cl. 52—148 **10 Claims**

1. An anchoring system for securing a structure with opposite sides to the ground, comprising:

an elongated flexible belt adapted to pass over said structure, said belt having two ends;

a pair of anchor housings located on opposite sides of said structure, both anchor housings each having an upper end and a lower end and having a first opening and a second opening and a third opening extending through each anchor housing, said first opening and said second opening being substantially parallel to one another and said first opening being located adjacent said upper end, said third opening being located adjacent said lower end and substantially at right angles to said first opening and said second opening;

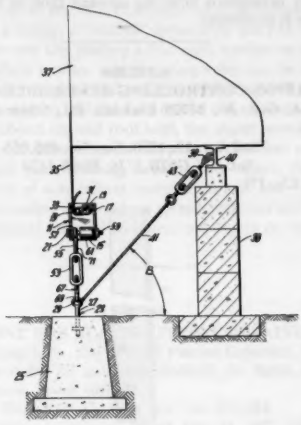
a pair of first pins each located in the first opening of one of said anchor housings;

a pair of second pins each located in the second opening of one of said anchor housings, each end of said elongated flexible belt engaging both the first pin and the second pin in one of said anchor housings;

a pair of third pins each located in the third opening of one of said anchor housings;

a pair of anchor foundation means partially imbedded in the ground and located substantially directly vertically below opposite sides of said structure;

a pair of connecting means each including elongated members connected at one end to one of said third pins and at the opposite end to one of said anchor foundation means; and



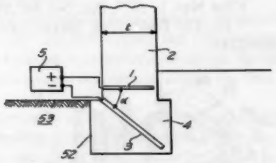
a pair of tie rods each connected at one end to one of said anchor foundation means and at the other end to said structure, each tie rod being located at an acute angle to the ground.

4,180,953

METHOD AND APPARATUS FOR COUNTERING AN UPWARD CAPILLARY FLOW OF SOIL MOISTURE IN A FOUNDATION WALL

Dinu S. Moraru, Str. Sibiel No. 1; Ion Tetcu, B-dul G. Cosbuc No. 93, and Constantin Mihaescu, Str. Stefan Furtuna No. 87, all of Bucharest, Romania

Filed Dec. 17, 1976, Ser. No. 751,794
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.14 **8 Claims**



1. In an electrically instrumented arrangement connectable to an AC supply network for countering an upward capillary flow of soil moisture in the foundation wall of a building joined at its base to a footing that underlies the wall and abuts the soil, the arrangement comprising, in combination, an array of first elongated electrodes each embedded in and extending along the thickness dimension of the wall in parallel spaced horizontal relation, a second elongated electrode embedded in the footing and extending diagonally downwardly in a vertical plane passing substantially symmetrically through the array of first electrodes, rectifier means having an AC input permanently connected to the AC supply network and having respective positive and negative DC output terminals, means for electrically connecting the positive terminal of the rectifier means in parallel to each of the first electrodes, and means for electrically connecting the negative terminal of the rectifier

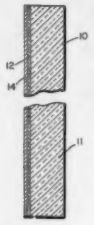
means to the second electrode, whereby when a capillary flow of the soil moisture in the wall extends up to the level of the first electrodes, a DC current path is automatically completed through each of the first electrodes and the second electrode to provide a hydrofuge barrier to the capillary flow of soil moisture, the resulting barrier-producing current flow being automatically maintained until the upward flow of the capillary moisture is terminated.

4,180,954

RADIATION CONTROLLING REVERSIBLE WINDOW

Harold A. Gell, Jr., 13720 Lockdale Rd., Silver Spring, Md. 20906

Filed Apr. 10, 1978, Ser. No. 895,055
Int. Cl.[2] G02B *5/26;* E06B *3/24*
U.S. Cl. 52—171 **9 Claims**



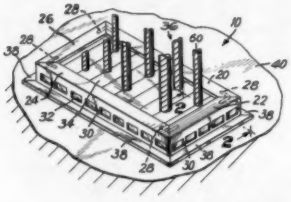
1. A glazing assembly, comprising:
a thermally insulating glass substrate;
a radiation absorption film comprised of a thermally conductive material affixed to one surface of said glass substrate; and
a radiation reflective film comprised of a thermally conductive material with one surface exposed to the atmosphere and an opposite surface secured to the surface of said radiation absorption film opposite said glass substrate whereby radiation absorbed by said radiation absorption film as heat is conducted to said radiation reflective film and radiated therefrom.

4,180,955

COMPUTER CABLE SHROUD ASSEMBLY

Paul Krstich, 536 W. 47th St., New York, N.Y. 10036

Filed Nov. 1, 1977, Ser. No. 847,593
Int. Cl.[2] E04B *5/48;* H01B *7/34*
U.S. Cl. 52—221 **1 Claim**



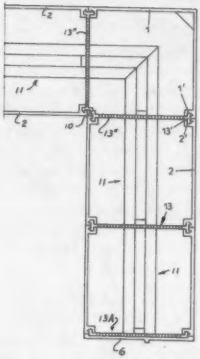
1. A computer cable shroud assembly comprising: a peripheral frame assembly formed adjacent an opening overlying a portion of flooring, a plurality of removable and replaceable strip members disposed adjacent the frame assembly and over said flooring, said strip members each capable of having an edge portion thereof severed to provide an aperture between adjacent strip members through which a cable may be located, said strip members comprising a plurality of mutually interlocking and replaceable modular strips formed with substantially and generally planar upper surfaces adapted to carry predetermined weight, each said strip including mating edge portions having a configuration capable of being engaged by and removably interlocked with an edge portion of an adjacent strip, said edge portions being capable of deformation and predetermined severance by the user to provide a resulting port able to accommodate a substantially vertically extending cable therethrough.

4,180,956

WALL TIE AND A WALL INCORPORATING THE WALL TIE

Fernand Gross, 23 rue de Molsheim, Strasbourg (Bas-Rhin), France

Filed Mar. 28, 1978, Ser. No. 891,396
Claims priority, application France, Apr. 6, 1977, 77 12486
Int. Cl.[2] E04B *2/00*
U.S. Cl. 52—407 **2 Claims**



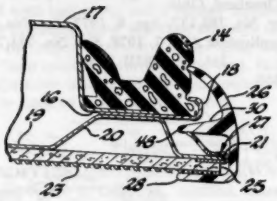
1. A wall comprising in combination a plurality of panel units disposed in two parallel vertical planes and edgewise abutting each other in each plane in vertical joints, a plurality of insulating elements disposed between said panel units and edgewise abutting each other in a vertical plane common to said joints, there being a plurality of said insulating elements disposed one atop the other, said panel units having grooves adjacent said joints, and at least one wall tie having two vertical elongated extremities each to which has two web portions that are spaced apart and parallel to each other and interfit in said grooves to hold abutting said panel units together, one of said extremities holding together the panel units in one of said two parallel vertical planes and the other of said elongated extremities holding together the panel units in the other of said two parallel vertical planes, and two vertically spaced serrated web portions extending between and interconnecting said elongated extremities of said wall tie, one of said serrated web portions fitting into a recess complementary in shape in an edge of one said insulating element and the other said serrated web portion fitting into a recess complementary in shape in another said insulating element which is in vertical alignment and edgewise abutment with said one insulating element, whereby said two serrated web portions hold said one and another insulating elements in vertical alignment and abutting relationship against vertical and horizontal movement relative to each other and relative to said panel units.

4,180,957

MOLDING CLIP

Charles W. Rantala, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1978, Ser. No. 953,219
Int. Cl.[2] E04C 2/38
U.S. Cl. 52—718 2 Claims



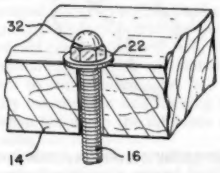
1. A molding clip adapted to secure a molding over adjacent edges of a plurality of juxtaposed parts wherein the molding has legs which extend past the edges and along the oppositely outwardly facing sides of the juxtaposed parts and wherein there exists a space between one of the molding legs and the outwardly facing side of one of the parts that changes substantially with a substantial change in the thickness of the parts, said clip comprising a pair of arms adapted to extend past the edge and along the outwardly and inwardly facing sides of the one part, the one arm on the outwardly facing side having first anchor means adapted to be normally spaced a predetermined distance from the other arm less than the thickness of the one part, said one arm further having a ramp portion extending to said first anchor means adapted to engage the edge of the one part and thereby effect deflection of said one arm whereby said arms are forceable to grippingly straddle the one part while said first anchor means is urged into anchoring engagement with the outwardly facing side of the one part, an extension integral with and adapted to extend from said one arm toward the one molding leg, said extension having second anchor means adapted to be spaced a predetermined distance from said first anchor means greater than the largest space between the one molding leg and the outwardly facing side of the one part, said extension including a ramp portion extending to said second anchor means adapted to be engaged by the end of the one molding leg and thereby effect deflection of said extension whereby the molding legs are forceable to straddle said extension and the juxtaposed parts while said second anchor means is urged into anchoring engagement with the one molding leg regardless of whether the space between the one molding leg and the outwardly facing side of the one part is changed substantially.

4,180,958

METHOD AND APPARATUS FOR FASTENING OBJECT TO CLAY TILE ROOF

Kenneth I. Brody, 2492 Banyon Dr., Los Angeles, Calif. 90049

Filed Nov. 25, 1977, Ser. No. 855,781
Int. Cl.[2] E04D 1/00
U.S. Cl. 52—747 5 Claims



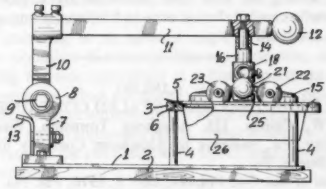
1. A method for fastening an object having a fastening hole to a corrugated clay tile roof utilizing a rod, threaded over at least a substantial portion at both ends, with a wing expansion nut at one end comprising the steps of: drilling a hole through said tile at a valley point where said tile rests on supporting wood; inserting said expansion nut through said hole sufficiently for its wings to expand, thus preventing the expansion nut threaded on the end of the bar from being pulled out of said hole; placing a washer of resilient material on said rod over the drilled hole in said tile, placing a first rigid washer on said rod over said resilient washer, and threading a first nut on said rod over said washer to press said resilient washer against the hole in said tile thereby to seal the hole in said tile around said rod; placing said object on said roof with the object spanning the ridges of two or more tiles for support so that said rod protrudes through said fastening hole in said object; placing a second washer of nonresilient material on said rod over said object; and threading a second nut on said rod over said second washer of resilient material to fasten said object on said roof.

4,180,959

MACHINE FOR SEALING FOOD CONTAINERS

Robert P. Hempel, Jr., Rua Manuel Pereira Guimares, 614, Sao Paulo, Brazil (04722), and Elder Rondelli, Av. Sabia, 699 Apt. 11, Sao Paulo, Brazil (04515)

Filed Aug. 14, 1978, Ser. No. 933,283
Claims priority, application Brazil, Oct. 31, 1977, 7707256
Int. Cl.[2] B65B 7/28
U.S. Cl. 53—334 5 Claims



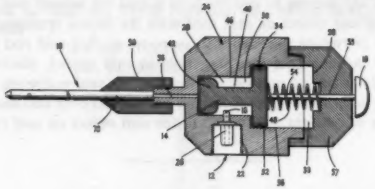
1. A machine for sealing food containers comprising:
(a) a horizontal base;
(b) support means attached to the base for supporting a container to be sealed;
(c) a ring having an inside diameter and an outside diameter attached to the support means, the ring having a first indentation forming a concentric circle on the surface of the ring and a second indentation within the first indentation;
(d) a first horizontally extending arm pivotally linked to the base for allowing vertical movement of the arm;
(e) a vertically extending arm attached to the first horizontal arm, extending downward and centered within the ring;
(f) a disk attached at its center to the vertical arm, such disk having a diameter greater than the inside diameter of the ring but less than the outside diameter of the ring;
(g) a vertical cylindrical sleeve encircling and rotatable about the vertical arm;
(h) a second horizontal arm attached to the vertical sleeve and rotatable about the vertical arm; and
(i) a train of rollers attached to the second horizontal arm comprising a first smooth vertical roller adapted for moving along the first indentation on the ring, a horizontal roller following the first roller having a radius extending inward of the ring over the first indentation, and a second vertical roller following the horizontal roller having a projection for engaging the second indentation and adapted for moving along the second indentation on the ring.

4,180,960

PRESSURIZING AND CONTROLLING FLUID FLOW TO A SEALED ARTICLE

George Wasserman, 110 Babcock St., Brookline, Mass. 02146, and Joseph J. Bushee, Waltham, Mass., assignors to George Wasserman, Brookline, Mass.

Filed Mar. 5, 1976, Ser. No. 664,373
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] B65B *31/08*
U.S. Cl. 53—403 7 Claims



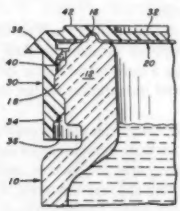
1. A method of adjusting the pressure within a tennis ball using a hollow-tipped needle and pressure source comprising:
cutting a cylindrical core from the wall of said ball with said needle,
urging said core from the wall to the inside of the ball by holding the cut core in the tip of the needle,
flowing gas from the pressure source through the hole formed by the removal of said core thereby altering the pressure in the ball,
and sealing the hole with said core by withdrawing the needle causing the cut core to frictionally engage the hole in the wall.

4,180,961

INDUCTION HEAT SEALED CONTAINERS

John W. Collins, III, Allegheny Township, Westmoreland County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 748,694, Dec. 8, 1976, Pat. No. 4,109,815.
This application May 8, 1978, Ser. No. 903,721
Int. Cl.[2] B67B *3/00*; B65B *7/28*
U.S. Cl. 53—421 1 Claim



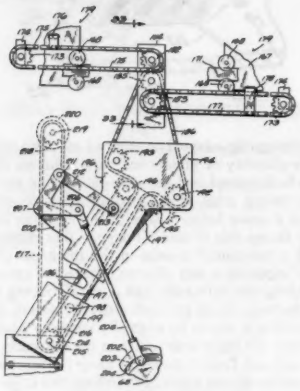
1. A method of sealing a container comprising providing a glass jar having a mouth with an upwardly facing surface and a continuous raised bead thereon with a narrow, upwardly convex cross-sectional configuration, filling said container, positioning a metal foil membrane with a heat seal resin on its undersurface across said container mouth and a heat and pressure-deformable plastic snap cap on the container mouth over said foil membrane, said snap cap having a material thickness over said bead of at least twice the height of the bead, and induction heating said foil membrane to heat the resin thereon and portions of said snap cap overlying said bead while applying high unit pressure against the top of said snap cap to impress said bead and the foil membrane into the plastic of said cap to form said foil membrane over the upwardly convex surface of said bead and seal the membrane to the jar continuously around the mouth thereof despite irregularities in the glass dimensions within commercially acceptable tolerances.

4,180,962

WRAPPING APPARATUS

Charles E. Michels, Racine, Wis., assignor to Reliance Electric Company, Cleveland, Ohio

Division of Ser. No. 785,137, Apr. 6, 1977, Pat. No. 4,134,246.
This application Aug. 7, 1978, Ser. No. 931,781
Int. Cl.[2] B65B *59/02*
U.S. Cl. 53—556 2 Claims



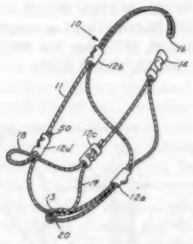
1. Mechanism for actuating a motion transmitting element selectively in an adjustment mode and in a driving mode, said mechanism comprising a chain coupled to said motion transmitting element, a fixed frame having rotors about which said chain turns and a swingable rocker arm having a swing end adjacent said rotors, said swing end having rotors about which said chain turns, chain drive means for driving said chain in said adjustment mode, and means for swinging said swing end of said rocker arm for driving said chain in said driving mode.

4,180,963

ADJUSTABLE ROPE HALTER AND KIT FOR ASSEMBLING THE SAME

Robert P. Anderson, 2800 S. University Blvd., #168, Denver, Colo. 80210

Filed Apr. 7, 1978, Ser. No. 894,353
Int. Cl.[2] B68B *1/02*
U.S. Cl. 54—24 2 Claims



1. A halter comprising a single continuous length of rope forming a headstall having a headband releasably engageable with a horse's head and a noseband for positioning about the horse's nose, said halter comprising a single continuous rope having an end portion engaged with a pair of spaced keepers to

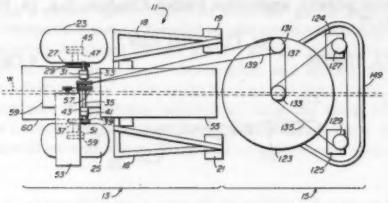
define an upper nose loop, a continuing portion of said rope extending from said upper nose loop and being looped back on itself and engaged with another keeper to form a headband loop, said headband loop being adapted to be releasably engageable with a clasp, a continuing portion of said rope extending from said headband loop being looped back on itself and engaged with still another keeper to form a lower jaw loop, said lower jaw loop being engaged through a ring, a continuing portion of said rope extending from said lower jaw loop into engagement with said clasp, and a further continuing portion of said rope extending from said clasp through said first mentioned pair of keepers to form a lower nose loop with said lower nose loop extending through said ring, said rope being slideably adjustable with respect to said keepers whereby said halter can be sized to fit the desired horse.

4,180,964

SELF-PROPELLED SELF-GUIDING LAWN MOWER

Dino G. Pansire, 219 E. Union St., Ashland, Mass. 01721

Filed Apr. 4, 1977, Ser. No. 784,164
Int. Cl.[2] A01D *75/28, 55/18*
U.S. Cl. 56—10.2 **12 Claims**



1. An automatic self-propelled, self-steering lawn mower adapted to follow a passive ribbon or wire of ferromagnetic material or permanent magnet impregnated material comprising:

(a) a prime mover, and

(b) a mower cutting attachment coupled to said prime mover,

(c) said prime mover comprising:

(1) a frame,

(2) left and right drive wheels mounted on and at least partially supporting said frame,

(3) a motor driven drive shaft mounted on said frame,

(4) left and right solenoid operated clutch means for coupling the drive shaft to the left and right drive wheels respectively,

(5) left and right solenoids coupled to said left and right solenoid operated clutch means, respectively, and

(6) a guidance and control assembly rigidly mounted on the frame for sensing deviations in the path of travel of said prime mover relative to said passive ribbon or wire and in response to said deviations decoupling one or both of said clutch means so as to either cause said prime mover to turn in a direction so as to correct such deviations or cut off the power to said drive wheels and quidance and control assembly comprising:

(a) a housing, a shaft mounted on the housing for rotational movement about its longitudinal axis,

(b) a bar magnet fixedly mounted on the shaft for self-rotation toward said passive ribbon or wire about a substantially horizontal axis directed substantially fore-and-aft with respect to the prime mover, said magnet being eccentrically mounted on said housing so as to tilt to one side when not under the influence of said passive ribbon or wire,

(c) a rotary switch, said rotary switch having a freely movable rotor arm and a fixed stator, said stator having a plurality of contacts,

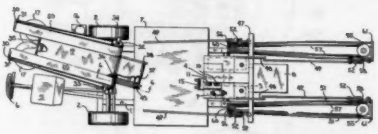
(d) said stator being fixedly mounted on the housing, said rotor arm being fixedly mounted on the shaft on the housing and said stator contacts being selectively connected electrically to said left and right clutch solenoids so as to selectively decouple one or both of said clutches according to the angular position of the magnet relative to the passive ribbon or wire.

4,180,965

TOBACCO HARVESTER

Matt Vedvig, Rte. 1, 979 County Trunk A, Edgerton, Wis. 53534

Filed Aug. 16, 1978, Ser. No. 934,043
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—27.5 **7 Claims**



1. A machine for harvesting tobacco comprising, a frame supported on wheels for movement along a row of tobacco plants, power means supported on the frame and adapted to propel the machine on the wheels, tobacco plant cutting means at the front of said frame for rotation and independent operation by the power means, a plurality of conveyors supported at the front of the frame and actuated by the power means and disposed to receive the tobacco plants severed by the cutting means and transport them toward the rear of the machine, and said conveyors being provided in a trough-like configuration with a generally central relatively wide conveying surface and side conveyors located on opposite sides of the central conveyor and extending at an upward angle from the central conveyor to complete the trough-like configuration, driven means driving the side conveyors at a faster speed than the central conveyor to effect discharge of the tobacco plants to the rear of the machine without injury to the leaves, and reciprocable shuttle means supported on the frame at the rear of the machine to receive the cut plants and convey them to the rear for drying purposes.

4,180,966

DEVICE FOR REGULATING THE HEIGHT OF THE CUTTER PLATFORM OF COMBINE HARVESTERS

Marcello Zen, Breganze, Italy, assignor to Pietro Laverda S.p.A., Breganze, Italy

Filed Sep. 28, 1978, Ser. No. 946,919
Claims priority, application Italy, Oct. 17, 1977, 53576/77[U]
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—208 **4 Claims**

1. Device for regulating the height of the cutter platform of a combine harvester, of the kind comprising:

at least one hydraulic jack for selectively lifting and lowering a cutter platform,

a distributor valve having a movable member, said valve being connected in the hydraulic circuit of said jack to control the operation thereof,

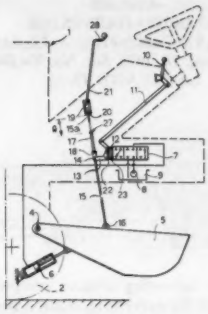
manual control means acting on said movable distributor valve member to control selectively the lifting and lowering of the cutter platform by the jack,

an automatic control device adapted to return the cutter platform automatically to an adjustable predetermined height upon release of the manual control means from a position in which it caused lowering of the cutter platform below the predetermined height, said automatic control means including a control member connected to the cutter platform, and means controlling the distributor valve in dependence upon the displacement of the control member,

wherein the improvement consists in:

the control member having an abutment surface and the said means controlling the distributor valve comprising:

a resilient element having one end which acts on the movable distributor valve member and an opposite end which reacts against said abutment surface of the control member, whereby when the platform is lowered under control of the manual control means to a height lower than the



predetermined height the resilient element is stressed in a sense to return the movable member of the distributor valve to a position corresponding to the predetermined height of the cutter platform upon release of the manual control means, and

means for varying the distance between the resilient element and the said abutment surface ofthe control member independently of the displacement of the platform.

4,180,967

CABLE-TWISTING TWO YARNS

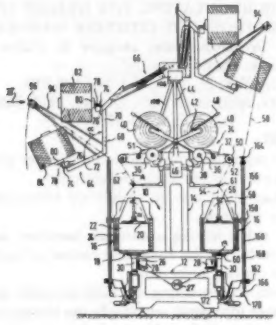
Aloys Greive, Munster, and Aloys Horstmann, Greven, both of Fed. Rep. of Germany, assignors to Hamel GmbH - Zwirnmaschinen, Munster, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,802

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726603; Dec. 21, 1977, 2757138

Int. Cl.[2] D01H *9/00, 13/04*

U.S. Cl. 57—66 **26 Claims**



3. An apparatus for twisting together a first and a second yarn, said apparatus comprising:

a frame;

respective first and second holders respectively adapted to support supplies of the first and second yarns;

a rotatable takeup spool on said frame underneath said first holder;

support means pivotally supporting said first holder on said frame for displacement substantially in an upright plane between an operating position relatively far above said takeup spool and a loading position below and horizontally offset from said operating position and generally level with said takeup spool, said support means being a parallelogrammatic linkage including a pair of generally parallel long links having inner ends pivoted at respective inner pivot axes on said frame and an outer transverse link carrying said first holder, said long links having outer ends pivoted at respective outer pivot axes on said outer transverse link, said pivot axes all being substantially parallel and perpendicular to said plane;

respective first and second guide means between said first and second holders and said takeup spool for feeding said first and second yarns from said first and second supplies to said takeup spool; and

takeup means for rotating said takeup spool and thereby winding said first and second yarns up on said spool.

4,180,968

COMPOSITE YARN AND METHOD OF FORMING SAID YARN

Breen C. White, Wollaton, England, assignor to Courtaulds Limited, London, England

Filed Oct. 27, 1977, Ser. No. 845,922

Claims priority, application United Kingdom, Sep. 19, 1977, 38921/77

Int. Cl.[2] D02G *3/04*

U.S. Cl. 57—239 **9 Claims**

1. A process for making a coherent composite yarn comprising providing at least one component yarn of untexturised cellulose acetate filaments and at least one other component yarn of polyester or polyamide filaments, twisting said component yarns together to form a composite yarn, and false-twist texturising said composite yarn.

4,180,969

ELECTRONIC TIMEPIECE WITH GLOBAL TIME ZONE DISPLAY

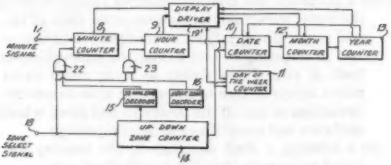
Okito Naito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,936

Claims priority, application Japan, Sep. 3, 1976, 51-106137

Int. Cl.[2] G04B *19/22, 19/24*

U.S. Cl. 58—42.5 **7 Claims**



1. In an electronic timepiece including series-connected counter means, each of said counter means being adapted to produce at least one timekeeping signal representative of the count of said counter means, display drive means for receiving each of said timekeeping signals and producing display driving signals in response thereto, a plurality of numerical display digits for receiving said display drive signals and displaying time information in response to the timekeeping signals produced by said counter means, a plurality of visual indication display segments peripherally disposed about said numerical

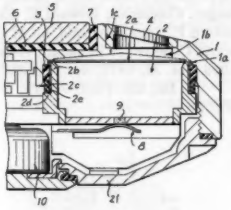
display digits and coupled to said display drive means for selectively indicating a predetermined time zone corresponding to the time displayed by said numerical display digits, the improvement comprising manually operated mode select means coupled to at least one of said counter means for selectively disposing said counter means between a local time mode and a global time mode, each of said counter means coupled to said mode select means being adapted to produce timekeeping signals representative of a predetermined local time zone when said mode select means disposes same in a local time zone mode, and indexing means coupled to the same counter means as said mode select means, said indexing means being adapted to index the count of each of said counter means that same are coupled to and thereby index the count of said timekeeping signals produced thereby to a count representative of a different global time zone, when said mode select means is disposed in a global time mode, said indexing means including zone counter means adapted to be indexed through a plurality of counts, each said count being representative of a global time zone, storage means for storing a first count representative of said predetermined local time zone, second storage means for storing a count representative of a further global time zone, and comparator means, coupled to said mode select means for comparing the count of said second storage means with the count of said zone counter means when said timepiece is disposed from a local time mode to a global time mode, said comparator means being adapted to index the count of said zone counter means until the count of said zone counter means is coincident with the count of said second storage means.

4,180,970

WRISTWATCH WITH SOUND-MAKING DEVICE

Ikuo Tokunaga; Hideaki Uchiyama, and Yoshiaki Fujimori, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,398
Claims priority, application Japan, Jul. 6, 1976, 51/89478
Int. Cl.[2] G04B *23/12, 37/08;* G04C *21/34;* G04B *39/00*
U.S. Cl. 58—57.5 **10 Claims**



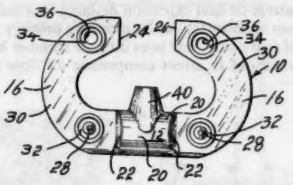
1. In a water resistant wristwatch case for supporting a sound-emitting device therein, the improvement comprising a watch case having a front exterior surface and a interior including a first sound-emitting aperture formed in said exterior surface of said case, and at least one cavity formed in the interior of said case, at least part of said cavity being disposed in overlapping relationship with said sound-emitting aperture in plan view, to define an acoustic connection therebetween, and a sound-emitting device positioned in said cavity, a gasket means disposed in said cavity and surrounding said sound-emitting device for water-sealing the interior of said wristwatch case, and a cover glass releasably mounted in the front exterior surface of said wristwatch case, said cover glass overlapping at least a portion of said cavity in plan view.

4,180,971

DETACHABLE LINK

Bernhard R. Klinke, 6902 - 226th Pl. Southwest, Mountlake Terrace, Wash. 98043

Filed Apr. 28, 1978, Ser. No. 900,888
Int. Cl.[2] F16G *15/04, 15/12*
U.S. Cl. 59—87 **6 Claims**



1. A detachable link comprising a pair of identical members of generally U-configuration assemblable in overlapping relationship to form a closed link;

each of said members having a generally circular cross section at the base thereof, said base having an inwardly extending boss terminating in a flat face, the base and boss having a generally circular passageway extending therethrough perpendicular to the face of said boss;

each of said members having symmetrical, arcuate leg portions tapering in thickness from the base to the termination thereof;

each of said leg portions having at least one aligning means, said aligning means comprising an upstanding tapered conical pin having a recessed portion around its base and a raised conical socket, the height of said pin being less than the thickness of said leg portion, said pin and socket positioned so that the pin of one member mates in the socket of the other member, and

a removable, cylindrical pin positioned in said passageway.

6. A method for making a detachable link, said method comprising:

forming a pair of identical members of generally U-configuration, each of said members having a generally circular cross section at the base thereof, said base having an inwardly extending boss terminating in a flat face, the base and boss having a generally circular passageway extending therethrough perpendicular to the face of said boss;

each of said members having symmetrical, arcuate leg portions tapering in thickness from the base to the termination thereof;

each of said leg portions having at least one aligning means, said aligning means comprising an upstanding tapered conical pin having a recessed portion around its base and a raised conical socket, the height of said pin being less than the thickness of said leg portion, said pin and socket positioned so that the pin of one member matably fits in the socket of the other member;

assembling said members in overlapping relationship to form a closed link, and

positioning a cylindrical pin in said passageway to unite the two members.

4,180,972

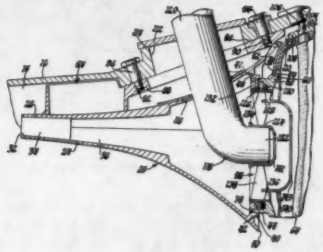
COMBUSTOR SUPPORT STRUCTURE

Avrum S. Herman, and Samuel B. Reider, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1978, Ser. No. 913,744
Int. Cl.[2] F02C *7/20*
U.S. Cl. 60—39.32 **2 Claims**

1. A combustor support structure in an air duct for supplying combustion products to the turbine nozzle of a gas turbine engine having a combustor support wall comprising in combination: multi-layered porous metal combustor having an inlet

end and an outlet end and an internal combustion chamber for receiving maximized combustion and dilution air flow through said porous metal wall, a dome of porous metal material secured to said combustor, said dome including a radially outwardly contoured ring segment forming a maximized air fuel mixing volume within said dome, a rigid support ring having a radial flange connected to said ring segment, said support ring further including an axial extension outboard of said dome, an air-blast nozzle on said extension defining an axial air inlet, an inlet diffuser member for axially directing primary air flow into the inlet of said dome, said inlet diffuser member having a low profile inlet snout to direct compressor air flow toward said



axial air inlet, said diffuser member further including an outlet end with a flared cone in axial alignment with said porous dome and including a circular lip on said cone spaced axially of said dome to accommodate axial movement between said dome and said diffuser member, a support secured to one side of said inlet diffuser member including means thereon for fixedly securing the inlet diffuser member to the combustor support wall and means for axially slidably supporting said lip on said rigid support ring to permit free thermal expansion of said dome relative to said fixed inlet diffuser member for preventing excessive stress build-up in the porous metal material of said dome.

4,180,973

VEHICULAR GAS TURBINE INSTALLATION WITH CERAMIC RECUPERATIVE HEAT EXCHANGER ELEMENTS ARRANGED IN RINGS AROUND COMPRESSOR, GAS TURBINE AND COMBUSTION CHAMBER

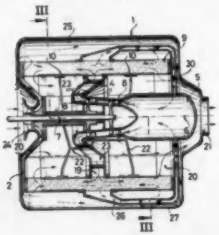
Siegfried Förster, Alsdorf; Günther Hewing, Jülich, and Manfred Kleeman, Quadrath-Ichendorf, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Dec. 6, 1977, Ser. No. 858,015

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712136

Int. Cl.[2] F02C *7/10*

U.S. Cl. 60—39.51 R **14 Claims**



1. A gas turbine power unit for a vehicle, of a kind including a combustion chamber having means for supplying fuel thereto, a compressor for supplying compressed air to said combustion chamber, a gas turbine for driving a drive shaft of the vehicle by the hot gases produced in said combustion chamber, and a counter-current heat exchanger for preheating the air compressed by said compressor with heat derived from the exhaust gases of said gas turbine, said gas turbine and combustion chamber having a common axis of symmetry, said gas turbine power unit also incorporating the improvement which consists in that:

said heat exchanger is a recuperative heat exchanger comprising a plurality of heat exchanger elements in an assembly of ring-like configuration encircling said compressor (**3**), turbine (**4**) and combustion chamber (**5***a*) and consists of ceramic heat exchanger elements (**9**) of elongated block form through which said exhaust gases and compressed air flow in counter-current to each other;

each said heat exchanger element has closed end surfaces and has orifices on two opposite sides respectively for the hot exhaust gases and for the compressed air, said orifices in each case including both orifices in the middle and orifices adjacent to each said end surface of the element, the set of orifices on each side being connected by longitudinal flow channels, the longitudinal flow channels of the respective sets of orifices being interleaved to facilitate heat exchange;

ducting and heat exchanger mounting is provided for supplying the hot exhaust gases to orifices in the middle of said heat exchanger element, thereby used as inlets, and for leading said hot exhaust gases from the corresponding orifices at the element ends used as outlets and also for supplying, on the opposite side of the elements, the compressed air to orifices at the element ends used as inlets and for leading said compressed air away from said elements at orifices in the middle of said heat exchanger elements, thereby used as outlets, whereby the end portions of said elements are cooler in operation than the middle portions thereof and and thereby less exposed to high temperature, and

said heat exchanger elements (**9**) are supported on a supporting structure (**10**) having elastic members (**11**) capable of compensating for or accommodating to thermal expansion effects.

4,180,974

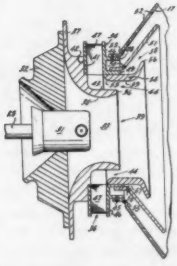
COMBUSTOR DOME SLEEVE

Richard E. Stenger, Cincinnati; Edward E. Ekstedt, Montgomery, and Stanford P. Seto, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 31, 1977, Ser. No. 847,459

Int. Cl.[2] F02C *7/00*

U.S. Cl. 60—39.71 **15 Claims**



1. An improved combustor dome assembly of the type having a fuel injector, a venturi, a primary swirler, a secondary swirler and a splashplate closely spaced from a dome, wherein the secondary swirler introduces a flow of air in a generally axial direction between the venturi and the splashplate, and a

portion of the splashplate is disposed at an acute angle to this axis, comprising:

a sleeve disposed between the venturi and the splashplate, said sleeve extending axially downstream further than the venturi and having a portion which is substantially axially disposed to form on its inner side the outer flow path of the flow of air from the secondary swirler, and on its outer side a downstream diverging cavity with the splashplate angled portion; and

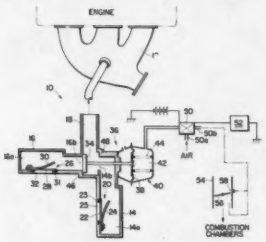
means for purging said cavity with air.

4,180,975

SECONDARY AIR SUPPLY SYSTEM USING REED VALVES

Yasuo Takagi, and Kazumasa Katoh, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1977, Ser. No. 863,693
Claims priority, application Japan, Dec. 27, 1976, 51-158268
Int. Cl.² F01N *3/10*
U.S. Cl. 60—290 **8 Claims**



1. In a system for supplying air into the exhaust system of an internal combustion engine by the action of exhaust pressur pulsation, the improvement comprising:

a plurality of reed valves through which the exhaust system is communicable with the atmosphere to induce atmospheric air into the exhaust system when each reed valve is operated to open upon receiving an exhaust pressure below the atmospheric pressure, the reed members of said plurality of reed valves being different in their characteristic-frequencies from each other;

selecting means for selectively put one of said reed valves at an operable condition in response to an engine operating condition.

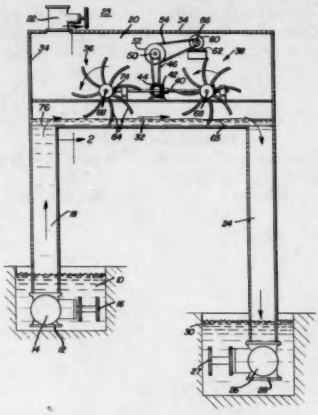
4,180,976

SIPHON MOTOR

Carl H. Bunn, P.O. Box 576, Myrtle Point, Oreg. 97458

Filed Apr. 27, 1978, Ser. No. 900,570
Int. Cl.² F15B *21/00*
U.S. Cl. 60—325 **8 Claims**

1. The combination of siphon means and generating means, said siphon means including water source below said generating means, a water discharge at a lower level below said generating means than the water source, an inlet column between said water source and a siphon channel, an outlet column between said siphon channel and the water discharge, said generating means comprising a water wheel in mechanical engagement with an electrical generator, said water wheel being rotatable by water flowing from said inlet column through said siphon channel to said outlet column, said generating means and said siphon means being sealingly enclosed by



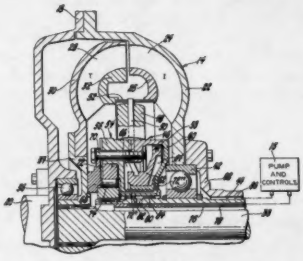
walls defining a working region at less than atmospheric pressure.

4,180,977

TORQUE CONVERTER WITH VARIABLE PITCH STATOR

John M. Beardmore, South Lyon, Mich., assignor to General Motors Corporation, Detroit, Mich.

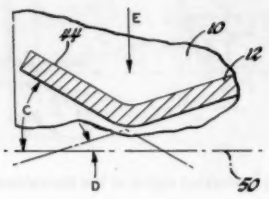
Filed Oct. 26, 1978, Ser. No. 954,971
Int. Cl.² F16D *33/04*
U.S. Cl. 60—342 **2 Claims**



1. A hydro-dynamic torque converter for a wheeled ground vehicle for transmitting and multiplying the output torque of an internal combustion engine comprising bladed fluid impeller means drivingly connected to said engine, bladed turbine means for receiving fluid circulated by said impeller means, output means rotatably driven by said turbine means, a stator assembly having a hub portion and a plurality of blades operatively disposed between the exit of said turbine and the entrance of said impeller means, mounting means supporting said blades on said hub portion for movement between open and closed position for controlling the direction of fluid exiting from said turbine means into said impeller means, hydraulically actuated piston means in said converter for moving said stator blades between said open and closed positions, a cavity in said hub portion for said piston means and cooperating therewith to form first and second chambers therein, a source of pressure oil for said converter, passage means connecting said source to a first of said chambers for biasing said piston in a direction to move said blades to an open position for optimized efficiency

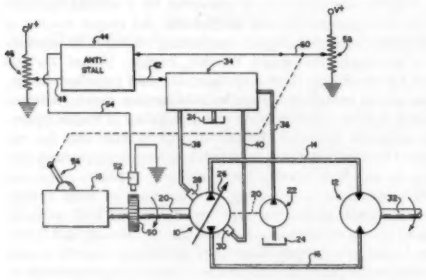
for vehicle cruising operation, and second passage means for feeding pressure fluid exiting from said turbine to said second chamber for biasing said piston in a direction to move said stator blades to a closed position whereby the flow path in said converter is changed to reduce the drive of said pump by the fluid discharged from said turbine to thereby reduce engine speed and to thereby improve the operating economy of said engine.

4,180,978
TORQUE CONVERTER
Don G. Maddock, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 12, 1978, Ser. No. 950,595
Int. Cl.[2] F16D *33/20*
U.S. Cl. 60—345 **2 Claims**



1. An improvement in engine driven torque converters wherein the engine is operated through a range of speeds including an idle speed; said torque converter has a bladed fluid impeller driven by said engine and absorbing torque therefrom, a bladed turbine in fluid flow relation with said impeller, and a bladed stator for redirecting fluid from said turbine to said impeller arranged to produce a toroidal flow path of hydraulic fluid, said improvement comprising; said blades of said impeller having a negative tip angle displaced 30° from the toroidal flow path at the fluid outlet thereof effective to reduce torque absorption capacity of said impeller at idle speed, and said stator blades having a sharp nose displaced circumferentially and angularly from the entrance flow to the stator from said turbine to induce turbulence in the toroidal flow path at the stator inlet at stall speeds.

4,180,979
ANTI-STALL CONTROL FOR ELECTRICAL HYDROSTATIC TRANSMISSION CONTROL SYSTEM
Charles R. Cornell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 22, 1978, Ser. No. 918,117
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—395 **10 Claims**

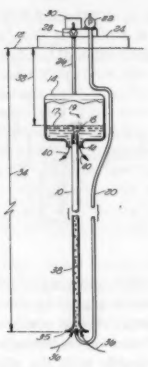


1. In a control system for a hydrostatic transmission of the type including an engine driven variable displacement fluid pump, the control system including main control means operable in response to an electrical input command signal to vary the displacement of the fluid pump, command signal generator means for generating an operative command signal, means providing a first electrical input signal representative of actual engine speed, and means providing a second electrical signal representative of unloaded engine speed, the improvement comprising:

(a) means for comparing said first and second electrical input signals and generating an electrical anti-stall signal representative of the maximum percentage of instantaneously commanded pump displacement which is permissible without causing the engine to drop below a predetermined minimum engine speed; and

(b) means for electrically multiplying said anti-stall signal and said operative command signal to generate a reduced input command signal.

4,180,980
HYDROPRESSURE POWER
Ronald A. Marks, 23362 Burton St., Canoga Park, Calif. 91304, and John O. Dorius, 121 Sinclair, Glendale, Calif. 91206
Filed Mar. 7, 1978, Ser. No. 884,106
Int. Cl.[2] F15B *11/06*
U.S. Cl. 60—398 **16 Claims**



1. A method for releasing absorbed pressurized air from a body of water, the steps comprising:

releasing an initial quantity only of gas in a submerged distal part of a self-sustaining means for conveying water;

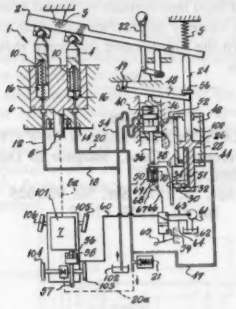
subsequent to release of said initial quantity of air, continuously collecting air exiting from the proximal end of said means in a reservoir container located above said distal part; and

displacing water from said reservoir container responsive to collection of said air.

4,180,981
HYDROSTATIC TRANSMISSIONS
Carlo Pensa, Esino Lario, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles
Filed Apr. 28, 1978, Ser. No. 900,905
Claims priority, application United Kingdom, Apr. 29, 1977, 17943/77
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—435 **5 Claims**

1. A vehicle having a prime mover, a hydrostatic transmission transmitting power from the prime mover to ground engaging members on said vehicle, a power take-off arranged to be driven by said prime mover and having clutch means for selectively engaging the power-take off with the prime mover, regulator means operable upon the transmission to maintain the

power consumption thereof below a predetermined level, and compensating means operable upon the regulator means upon



engagement of the clutch means to reduce said predetermined level of power consumption of the transmission.

4,180,982

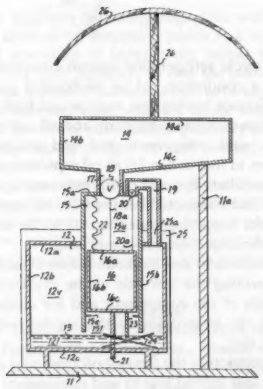
INSTANT RETURN-STROKE DIFFERENTIAL TEMPERATURE ENGINE

Israel Siegel, 351 W. 71 St., New York, N.Y. 10023

Filed Mar. 21, 1977, Ser. No. 779,709

Int. Cl.[2] F03G *7/06*

U.S. Cl. 60—531 **4 Claims**



1. An instant return stroke differential temperature engine consisting of a relatively cold and a relatively warm chambers,

said chambers containing an evaporating liquid to obtain a vapor pressure differential between the cold and warm chambers,

a moving member responding to said vapor pressure differential,

a communication of one side of the moving member with the warm chamber,

a communication of the opposing side of the moving member with the cold chamber to obtain a pressure differential upon the opposing sides of the moving member,

means for establishing a communication of said opposing side of the moving member with the warm chamber to equalize the pressure upon the sides of the moving member and allow a return of the moving member to its initial position,

and means for stopping the communication of said moving member with the cold chamber to prevent loss of thermal energy during said return of the moving member to its original position.

4,180,983

DEVICE FOR PREVENTING LEAKAGES OF WORKING FLUID FROM A HEAT ENGINE

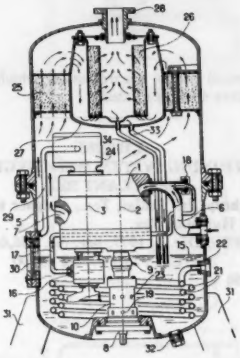
Pierre Maginot, Paris, and Roger Le Peutrec, Chatenay Malabry, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Apr. 10, 1978, Ser. No. 895,178

Claims priority, application France, Apr. 12, 1977, 77 10889

Int. Cl.[2] F01K *25/08, 11/00*

U.S. Cl. 60—657 **2 Claims**



1. A device for preventing leakages of a working fluid from an engine which operates by means of the internal energy of the fluid and which operates in a closed cycle, the improvement wherein: the engine is supported inside a fixed and sealed chamber with its output shaft extending vertically downwards, a transmission shaft is aligned with said engine output shaft and coupled to said output shaft by means of a coupling allowing some radial and axial play, said transmission shaft passing through said chamber, a lower bearing axially fixing the transmission shaft and an upper bearing radially fixing said transmission shaft but allowing a free axial expansion thereof, a rotating seal ring in the vicinity of the lower bearing which fixes the shaft axially and cooperating with a fixed seal ring integral with said chamber, said seals being lubricated by means of a lubricant contained in the lower part of said chamber, lubricant supply orifices for said seals being provided in a support bushing for the seals and the bearings, at a higher level than that of the bottom of the chamber, and heating means for keeping the lubricant at a temperature causing the evaporation of said fluid which is contained in the lubricant.

4,180,984

CRYOGENIC APPARATUS HAVING MEANS TO COORDINATE DISPLACER MOTION WITH FLUID CONTROL MEANS REGARDLESS OF THE DIRECTION OF ROTATION OF THE DRIVE SHAFT

Fred F. Chellis, Concord, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

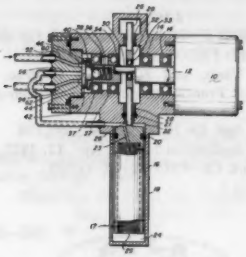
Filed Dec. 30, 1977, Ser. No. 866,148

Int. Cl.[2] F25B *9/00;* **F01B** *29/10;* **F02G** *1/04*

U.S. Cl. 62—6 **13 Claims**

1. In a cryogenic apparatus including a refrigerator having a reciprocable displacer; fluid control means for sequentially delivering a high pressure fluid to and exhausting a low pressure fluid from said refrigerator; and a motor driving a rotary drive shaft which operates the displacer and said fluid control means;

the improvement of additionally including means for providing proper coordination between the displacer and said



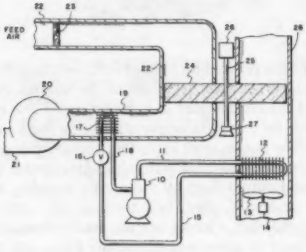
fluid control means regardless of which direction said rotary drive shaft is rotated.

4,180,985

AIR CONDITIONING SYSTEM WITH REGENERATABLE DESICCANT BED

Lynn L. Northrup, Jr., Dallas, Tex., assignor to Northrup, Incorporated, Hutchins, Tex.

Filed Dec. 1, 1977, Ser. No. 856,400
Int. Cl.[2] F25D *17/06, 23/00*
U.S. Cl. 62—94 **19 Claims**



1. In a refrigeration type air conditioning system which includes a compressor, an evaporator and a condenser, a vaporizable refrigerant contained within a closed conduit communicating with said compressor, said evaporator and said condenser, the improvement which comprises a regeneratable desiccant material, means to pass a first fluid into contact with said desiccant material to thereby remove at least a portion of the water vapor from said first fluid and to produce a desiccant material at least partially saturated with water, means to thereafter pass the thus treated first fluid into contact with said evaporator, thereby cooling said thus treated first fluid, means to pass a second fluid into contact with said condenser to thereby heat said second fluid and means to contact the thus heated second fluid with at least a portion of the at least partially water saturated desiccant material to thereby at least partially regenerate said desiccant material.

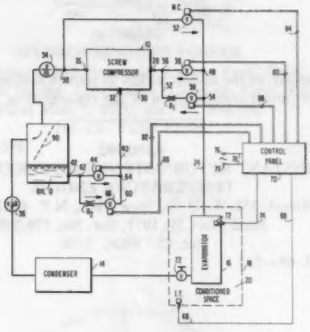
14. In a process for air conditioning a structure with a refrigeration type air conditioning system which includes a compressor means, an evaporator means, a condenser means and a vaporizable refrigerant contained within a conduit means communicating with said compressor means, said condenser means and said evaporator means, the improvement comprising passing a first fluid into contact with a regeneratable desiccant means in a first conduit means to remove at least a portion of the water vapor from said first fluid and to produce a desiccant at least partially saturated with water, passing the thus treated first fluid into contact with said evaporator means in a second conduit means, removing at least a portion of said desiccant which is at least partially saturated with water and passing it to a third conduit means, passing a second fluid into contact with said condenser to thereby heat it and thereafter passing the thus heated second fluid into contact with said at least partially saturated water to thereby regenerate said desiccant material and means to return the regenerated desiccant material to said first conduit means.

4,180,986

REFRIGERATION SYSTEM ON/OFF CYCLE

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Apr. 25, 1978, Ser. No. 900,025
Int. Cl.[2] F25B *43/02*
U.S. Cl. 62—192 **6 Claims**



1. An on/off cycle refrigeration system comprising: (a) an evaporator; (b) a condensor; (c) an oil-flooded positive displacement compressor having low suction and high discharge sides; (d) a first line carrying refrigerant and oil and connecting said evaporator, said compressor and said condenser in a closed-series loop, in that order; (e) an oil separator within said loop and positioned between said compressor and said condensor; (f) a second line connected between the oil separator and the compressor for supplying separated oil to the compressor for lubrication, the improvement comprising:

(a) means responsive to low load conditions of said evaporator for connecting the low side of the evaporator to the discharge side of the compressor and for cutting off the low side of the evaporator to the suction side of said compressor; and

(b) means for restricting the flow of oil from said oil separator through said second line to said compressor such that the low side of the screw compressor is pulled down into the vacuum range, and the high side of the screw compressor is bled off to the low pressure existing in the system evaporator, with the compressor operating at essentially zero load under low power consumption and with limited lubricating oil being fed to the compressor.

4,180,987

ADJUSTABLE SPACERS FOR FLAT PLATE FOOD FREEZERS

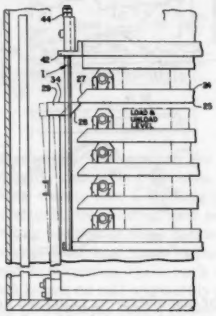
Thomas P. McLaughlin, Macedonia, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Sep. 12, 1977, Ser. No. 832,168
Int. Cl.[2] B30B *7/02;* **F25D** *25/00*
U.S. Cl. 62—341 **11 Claims**

1. In a device for handling generally flat packages of food, comprised of:

(a) A housing having horizontally aligned loading and discharge openings;

(b) Upwardly facing loading and unloading surfaces adjacent said openings;
(c) A stack of a plurality of spaced generally flat horizontally extending plates within said housing;
(d) Spacer bars between each pair of adjacent plates having upper and lower sides in abutting relationship with corresponding upper and lower surfaces on said plates to space said plates a predetermined thickness corresponding to the thickness of a food package;
(e) Upper and lower support members for said stack;
(f) Tension rods extending vertically upwardly from said lower support member past and movable relative to said upper support member,
(g) An adjustable stop on each rod adapted to rest on an upwardly facing surface associated with said upper support member;



(h) Latch members releasably engagable with downwardly facing surfaces on successive plates as a stack of plates is moved upwardly to support the partial stack of plates above said latch members so that the partial stack below said latch members can be lowered to be supported by said tension rods and stops with the upper surface of the top plate of the lower partial stack generally aligned with the upwardly facing surface of said loading and unloading surfaces;
(i) The improvement which comprises: said spacer bars each having at least two pairs of flat parallel sides spaced apart different distances, and means on said plates permitting selective rotation of said bars to bring selected pairs of sides into spacing engagement with said surfaces.

4,180,988

BI-DIRECTIONAL FILTER-DRIER FOR HEAT PUMPS

Jimmy L. Forte, 2815 Madison Ave., Granite City, Ill. 62040, and Creo B. Lindsay, 1206 Grand Ave., Madison, Ill. 62060

Filed Mar. 20, 1978, Ser. No. 888,140

Int. Cl.[2] F25B *43/00*

U.S. Cl. 62—474 **8 Claims**

1. For use in filtering moisture and contaminants from the refrigerant flowing in the refrigerant lines of a heat pump system having a reversible flow refrigerant line which, for the cooling mode of the heat pump system, contains high pressure refrigerant flowing in one direction, and which, for the heating mode of the heat pump system, contains low pressure refrigerant flowing in the opposite direction,

bi-directional filter-drier apparatus comprising

a first Y-connector having

a straight tubular trunk portion, and

two tubular leg portions joining said trunk portion at a juncture and extending to leg tip parts parallel to each other,

a second Y-connector identical to said first Y-connector,

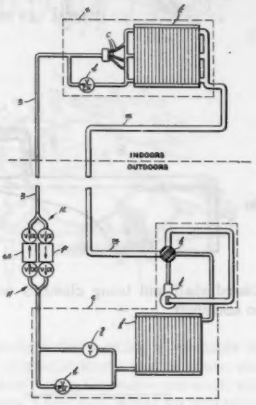
the tubular trunk portions of said Y-connectors being connected in such reversible flow refrigerant line,

a first filter-drier of a type especially adapted to filter high pressure refrigerant, and having an inlet at one of its ends and an outlet at its opposite end,

a second filter-drier of a type especially adapted to filter low pressure refrigerant, and having an inlet at one of its ends and an outlet at its opposite end,

said first Y-connector having one of its said leg tip parts connected to said inlet of said first filter-drier and the other of its said leg tip parts connected to said outlet of said second filter-drier,

said second Y-connector having one of its said leg tip parts connected to said outlet of said first filter-drier and the



other of its said leg tip parts connected to said inlet of said second filter-drier,

a check valve interposed at the outlet of each of said first and second filter-driers, whereby to prevent refrigerant flow into said outlet on reversal of direction of flow in said refrigerant line, and

a check valve interposed at the inlet of each of said first and second filter-driers,

whereby on reversal of such flow to prevent entrainment into the reverse flow, of contaminants previously trapped in the filter-drier.

4,180,989

UNIVERSAL JOINT CONSTRUCTION

Günther Lange, Damme, Fed. Rep. of Germany, assignor to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,591

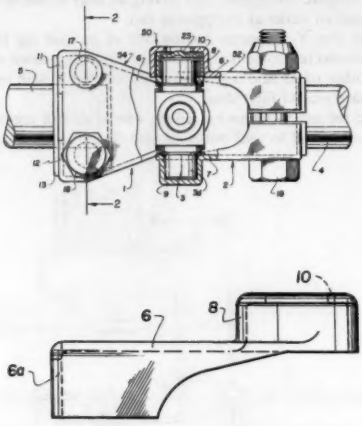
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733772

Int. Cl.[2] F16D *3/26*

U.S. Cl. 64—17 R **9 Claims**

1. A universal joint connectable between a driving and a driven shaft in particular for motor vehicle steering mechanisms, comprising a cross link member having two sets of diametrically opposite rorational support pins, first and second joint fork assemblies, each of said assemblies having two fork halves stamped out of thin metal sheet and including a first end with a cylindrical seat formed therein to seat a pin of the cross link and an opposite end engageable over a portion of the associated shaft along with another fork half portion which is connected with its respective opposite end over the remaining portion of said shaft, said fork halves being positively combined into one unit so as to be form fitting and being of U-shaped cross section, said forks being trapezoidal in a longitudinal directon of the fork halves from the first end to the second end thereof. Said second ends of said fork halves having bearing seats for the respective shafts with a flange ori-

ented radially inwardly and including a hub portion disposed within the radially inwardly directed flange, engageable over



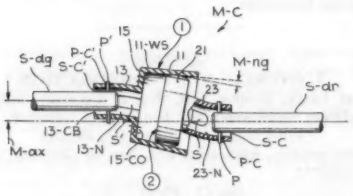
the associated shaft and being clamped with said fork half portion to said shaft.

4,180,990

BI-DIRECTIONAL OVERRIDE COUPLING

Terence A. Hill, Bromley, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 11, 1978, Ser. No. 932,923
Int. Cl.[2] F16D *7/02*
U.S. Cl. 64—30 R **15 Claims**



4. An improved inter-shaft clutch coupling comprising a pair of resilient male and female members, each constructed and adapted to be attached to an associated rotatable shaft and to interfit so as to couple one shaft to be driven by the other, while also including respective frictional interfit means and, further, accommodating relative axial and/or angular misalignment therebetween;

one such member comprising a cup means having resilient conic walls including inner friction-sectors, and projected upon a shaft-receiving resilient boss;

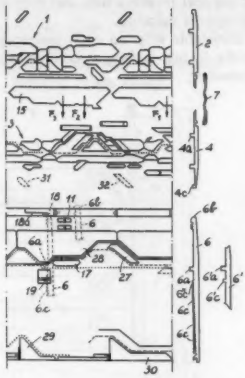
the other member comprising a resilient-walled head means including peripheral friction members and mounted upon a resilient shaft-receiving boss, said head including frictional means about the periphery thereof adapted to be received by said friction-sectors in torque-limiting frictional enngagement.

4,180,991

METHOD AND DOUBLE-CYLINDER CIRCULAR KNITTING MACHINE FOR MANUFACTURING PATTERNED KNITTED FABRICS

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Nov. 21, 1977, Ser. No. 853,709
Claims priority, application Italy, Dec. 1, 1976, 30007 A/76
Int. Cl.[2] D04B *9/10*
U.S. Cl. 66—14 **7 Claims**



1. A method for manufacturing patterned knitted fabrics, in particular stocking articles, on a double cylinder circular knitting machine having upper and lower needle cylinders, needles and corresponding sliders slidable therein, jacks associated with the sliders slidable in said lower needle cylinder, jacks corresponding to needles knitting in said upper needle cylinder, a number of yarn feeding stations, jack tilt-out cams associated with said feeding stations, and jack selecting devices, wherein the jacks corresponding to the needles in said lower needle cylinder selected to pick up yarn at said feeding stations but one of said feeding stations and the jacks corresponding to the needles in said upper needle cylinder are brought, after said selected needles have each formed a stitch, to an inoperative position in which they do not interfere with that of said tilt-out cams which is associated with said one of said feeding stations, said jacks brought to said inoperative position being subsequently brought all to a position such that they can be raised to bring corresponding needles to pick up yarn at said but one of said feeding station, and wherein those of said jacks are precluded from being raised, which are associated with said selected needles knitting in said lower needle cylinder and each having already formed a stitch a same knitting course.

4,180,992

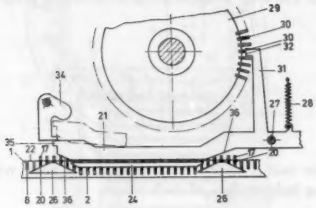
PATTERN SETTING ARRANGEMENT OF KNITTING MACHINE

Hans Schieber; Krause Erich both of, Bopfingen, and Reinhold Schimko, Aalen-Wasseralfingen, all of Fed. Rep. of Germany, assignors to Universall Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Westhausen, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,716
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728343
Int. Cl.[2] D04B *7/00*
U.S. Cl. 66—75.1 **7 Claims**

1. In a pattern setting arrangement for a knitting machine having a needle bed, a plurality of needles movably mounted in channels in said needle bed, a carriage movable over said needle bed, at least one pattern drum carried by said carriage, the plurality of rocking sinkers disposed in said channels, said rocking sinkers having rearwardly extending lever arms pro-

vided with upstanding feet, and pressure bar means mounted on said carriage in operative relationship with said pattern drum for determining the position of said rocking sinkers through operable engagement with said feet on said rearwardly extending lever arms of said rocking sinkers, the improvement comprising each rocking sinker having an additional foot disposed on the free end of said rearwardly extending lever arm and extending longitudinally of and outwardly beyond said channels and fixed cam means mounted on said carriage for engaging said foot on selected ones of said rocking



sinkers upon passage of the carriage over the needle bed for pressing said rearwardly extending lever arms of said selected ones of said rocking sinkers into a working position within their respective channels, for holding said selected rocking sinkers in said working position during a knitting cycle and for returning said rocking sinkers to their normal non-working positions at the end of a knitting cycle, each of said rocking sinkers having hook means on said rearwardly extending lever arm and extending downwardly into a respective channel of said needle bed.

4,180,993

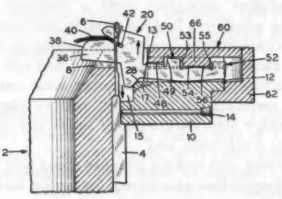
SINKER-NEEDLE MOTION REDUCER

Morris Philip, c/o Philip Knitting Mill, 26 Bruckner Blvd., Bronx, N.Y. 10454

Continuation of Ser. No. 737,672, Nov. 1, 1976, abandoned. This application Oct. 12, 1978, Ser. No. 950,727

Int. Cl.[2] D04B *15/06, 15/24*

U.S. Cl. 66—107 **11 Claims**



4. A circular knitting machine having a needle cylinder, independently movable needles mounted on said cylinder for longitudinal, reciprocal movement on said cylinder, a sinker ring fixedly mounted on said cylinder, independently movable sinkers mounted on said sinker ring for reciprocal movement on said sinker ring in a direction radial to said cylinder, means for reciprocating said sinkers and stationary means on said sinker ring adjacent said needles for engagement with means on said sinkers for raising the ends of said sinkers adjacent such needles as said sinkers are reciprocated in said radial direction away from said cylinder and for lowering the ends of said sinkers adjacent such needles as said sinkers are reciprocated in said direction toward said cylinder, each of said sinkers having a first surface for engaging the yarn being knitting as the sinker is reciprocated away from said cylinder and the needle end of said sinker is raised and a throat for engaging and holding the knitted fabric as the sinker is reciprocated toward said cylinder and the needle end of said sinker is lowered, said throat slanting downwardly and rearwardly from said yarn engaging first surface when said sinker is reciprocated toward said cylinder and the needle end of said sinker is lowered.

4,180,994

WASHING MACHINES

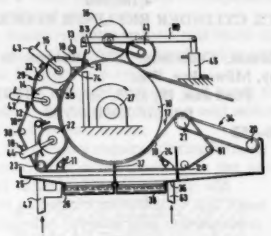
Maurice C. Lemon, and John F. Spear, both of Dorking, England, assignors to Universal Towel Company Limited, Sussex, England

Filed Aug. 9, 1978, Ser. No. 932,315

Claims priority, application United Kingdom, Aug. 12, 1977, 33979/77

Int. Cl.[2] D06B *1/02, 23/20*

U.S. Cl. 68—18 F **5 Claims**



1. A washing machine for washing a washable dust mat comprising a drum around at least a part of whose circumference each mat is passed during successive pre-wash, main wash and rinsing operations, a first tank means for supplying a main wash liquid to each mat in turn from the first tank, means for collecting the used main wash liquid and returning it to the first tank, an overflow from the first tank, a second tank connected to said overflow from the first tank, means for supplying the liquid from the second tank as a pre-wash liquid to each mat in turn, means for collecting the used pre-wash liquid and returning it to the second tank, an overflow from the second tank connected to drain, a supply of fresh water for rinsing each mat, and means for collecting the used rinsing water and feeding it to the first tank.

4,180,995

PRESSING APPARATUS FOR SQUEEZING LAUNDRY AND THE LIKE

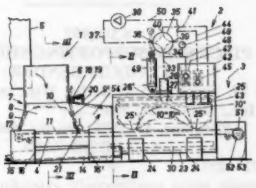
Arnfried Meyer, Wurzburger Strasse, 7100 Heilbronn, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,094

Claims priority, application Austria, Dec. 13, 1976, 9194/76

Int. Cl.[2] D06F *47/06*

U.S. Cl. 68—242 **16 Claims**



1. A press for squeezing out batch material, especially laundry, comprising:

an elastic pressure member that can be charged with a pressure medium,

a housing, said pressure member being positioned in said housing, and

a liquid-permeable conveyor belt guided through said hous-

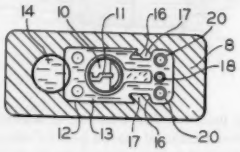
ing to transport the batch material from a loading station outside said housing, to a pressing station below the pressure member, and after squeezing, to a discharge station outside said housing, characterized in that said housing is generally tubular, the pressure member is disposed generally in the region of only one half the inner periphery of the housing, and a bearing member is provided in the other peripheral half, and that said bearing member is made as a support for the liquid-permeable conveyor belt that is guided through the housing, and in that below the conveyor belt there are conduits in the bearing member for liquid expressed from said batch material by said pressure member.

4,180,996

PADLOCK CYLINDER RETAINER BLOCK SECURING MEANS

Horst Lebrecht, Cedarburg, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Jun. 19, 1978, Ser. No. 916,877
Int. Cl.[2] E05B *67/02*
U.S. Cl. 70—52 **8 Claims**



1. In a key controlled padlock having a body of generally curved contour with an exteriorally opening cavity therein of generally rectangular contour, a cylinder retainer block corresponding to the shape of said body cavity and substantially filling the latter and having wall portions closely adjacent wall portions of said body, there being a generally rectangular crevice outlining said cavity outwardly of the adjacent wall portions of the lock body and retainer block, a cylinder operatively housed within said retainer block and having a key slot therein, said crevice and said key slot being accessible through the exteriorally opening portion of the body cavity, mating means formed in and on adjacent wall portions of the body and block to prevent separation of the body and block or damage to the body walls should a foreign object be inserted into an exteriorally accessible portion of the body cavity and manipulated therein, said mating means including eccentrically shaped grooves formed in said wall portions of the retainer block and eccentrically shaped ribs formed on said wall portions of said body, the grooves and ribs extending throughout the heights of their respective members, and hardened metal pins extending from portions of the body with portions of said block.

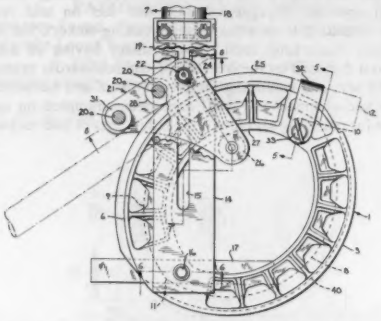
4,180,997

SINGLE PIECE SELF-SUPPORTING SHOE FOR USE IN A CONDUIT BENDER

Raymond M. Evenson, New Berlin, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Apr. 17, 1978, Ser. No. 896,758
Int. Cl.[2] B21D *7/024*
U.S. Cl. 72—217 **4 Claims**

1. A single piece continuously extending self-supporting multiple bending shoe for use in conduit bending apparatus, said shoe having an outwardly facing arcuately shaped groove extending on opposite sides of the shoe with the radius of each respective groove being of different length so that thin wall conduit and intermediate and rigid wall conduit of different outside diameters can be received in the respective grooves on opposite side portions of the shoe and bent in the shoe to the angular configuration desired, and the bending shoe on opposite sides being developed in the arc of a circle so that one side of the shoe has a center of radius which is offset from the



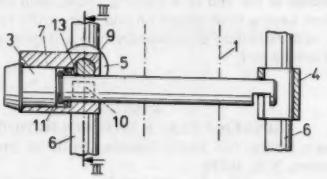
center of the radius of the other side of the shoe with said centers being independent of each other.

4,180,998

BICYCLE LOCK

Erkki Hellman, Rymattyla, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Mar. 31, 1978, Ser. No. 892,184
Int. Cl.[2] B62H *5/14*
U.S. Cl. 70—227 **15 Claims**



1. A locking device for a lockable unit having a rotatable wheel positioned between a pair of stationary members, comprising

a locking member swingable from a releasing position through the wheel to a locking position and vice-versa,

a locking mechanism connected to said locking member and having an element which turns about a first axis,

means connecting said locking member with one of said stationary members for movement relative thereto and with said other stationary member under the control of said locking mechanism, and

means for turning said locking member about said first axis which is a longitudinal axis thereof for freeing said locking member from engagement with said other stationary member, said connecting means providing means for swinging said locking member about a second axis transverse to said first axis solely after said locking member has been turned about said first axis from a first position preventing swinging movement thereof to a second position thereof permitting swinging movement of said locking member about said second axis.

4,180,999

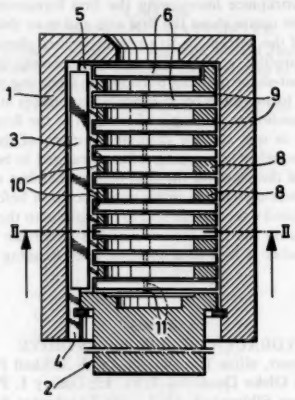
CYLINDER LOCK

Oiva Hurskainen, Joensuu, and Franz Kiraly, Turku, both of Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Continuation of Ser. No. 727,524, Sep. 28, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 924,082
Claims priority, application Finland, Oct. 3, 1975, 752760
Int. Cl.[2] E05B *15/14, 29/00*
U.S. Cl. 70—366 **6 Claims**

1. A cylinder lock comprising a cylinder housing, a hollow

cylinder turnable in said housing, a locking bar movable in a slot provided in the wall of said hollow cylinder between (a) a locking position, in which said locking bar extends partly outside the outer surface of said cylinder and is partly received in a recess provided in said cylinder housing, thereby locking the turning movement of said cylinder relative to said cylinder housing, and (b) a releasing position in which said locking bar has moved radially inwardly relative to said cylinder housing and out from said recess, said cylinder lock further comprising a plurality of separate and independent locking discs having key engaging means so as to be turnable by a key of the lock,



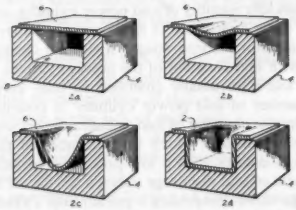
said cylinder including spaced immovable partition walls between which respective locking discs are rotatably received, said walls being in rigid connection with said cylinder, said cylinder having openings between said partition walls, said openings allowing insertion of said locking discs into said cylinder from one side thereof, said cylinder having integral part-annular wall portions joining adjacent partition walls, said integral part-annular wall portions having inner surfaces rotatably supporting the locking discs, said locking discs each including a radial protrusion for centering said locking disc by means of the inner surface of said cylinder housing at said openings between said partition walls.

4,181,000

METHOD FOR SUPERPLASTIC FORMING

C. Howard Hamilton; Neil E. Paton, both of Thousand Oaks, and John M. Curnow, Agoura, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 4, 1977, Ser. No. 839,243
Int. Cl.² B21D *26/04*
U.S. Cl. 72—60 **4 Claims**



1. A method of forming a part comprising the steps of:

(a) providing a blank of material which exhibits an effective value of strain rate sensitivity at a forming temperature;

(b) providing a die having a surface which is complementary to the shape of the part;

(c) determining a relationship between time and the pressure required to form said blank against said surface of said die at a strain rate corresponding to said effective value of strain rate sensitivity for said blank, wherein said step of determining comprises:

obtaining a relationship between strain rate sensitivity and strain rate, and a relationship between flow stress and strain rate at said forming temperature;

selecting from said relationship between strain rate sensitivity and strain rate a value of strain rate which provides said effective value of strain rate sensitivity;

selecting from said relationship between flow stress and strain rate a value of flow stress corresponding to said selected value of strain rate;

calculating strains required to form said blank to selected stages of forming based upon the change in geometry of said blank between said stages;

calculating times required to form said blank to each of said stages of forming by dividing said selected strain rate into each of said strains;

calculating the pressure required during forming to sustain said selected flow stress based upon the geometry of said blank at said stages of forming; and

relating said calculated pressures to said times to obtain said relationship between time and pressure;

(d) positioning said blank in said die;

(e) holding said blank at said forming temperature so that said blank exhibits said effective value of strain rate sensitivity; and

(f) automatically applying pressure across the thickness of a portion of said blank in accordance with said relationship between time and pressure to induce stresses in said blank and form said blank against said surface of said die, wherein said step of automatically applying pressure comprises:

measuring pressure on said side of said blank opposite said die;

converting said time and pressure relationship to a command signal;

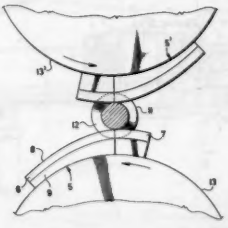
controlling pressure on said side of said blank opposite said die using said command signal and said measured pressure so that pressure is automatically applied in accordance with said time and pressure relationship, whereby said blank is formed into the part.

4,181,001

CROSS WEDGE ROLLING APPARATUS

Jan Zálešák, Modrice, and Miloslav Bednar, Brno, both of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia

Filed Mar. 30, 1978, Ser. No. 891,916
Int. Cl.² B21H *8/02*
U.S. Cl. 72—108 **1 Claim**



1. Apparatus for cross wedge rolling parts of reduced diameter from workpieces in the form of bodies of revolution, the rolled parts having a central portion of reduced diameter and lateral portions of larger diameter extending from the respec-

tive ends of the central portion of reduced diameter being of broad V shape with a cylindrical base and oppositely inclined side surfaces, said apparatus comprising two opposed working rolls adapted for rotation in the same direction about parallel axis, a tool on each of said working rolls, each tool having an axially central workpiece reducing cam surface and cam reducing surfaces extending laterally beyond the respective ends of the central reducing cam surface, said central reducing cam surface and lateral cam reducing surfaces extending along the entire axial length of the tool, said lateral reducing surfaces forming with the axis of rotation of the tool angles the value of which depends upon the diameter d of the base of the broad V-shaped central reduced portion of the rolled workpiece, the initial diameter D of the workpiece, and the value V_k, V_k and α responding to the formulae:

$$V_k \doteq \frac{\frac{D}{2} - \frac{d}{2}}{\alpha}$$

and

$$\alpha \doteq \frac{\frac{1}{3}(D^2 + dD + d^2)}{S(D + d)},$$

where α is the angle of the inclined side surfaces at the ends of the broad V-shaped central reduced diameter portion of the rolled workpiece, said angle being measured with respect to the axis of the workpiece,

D is the original diameter of the body,

d is the diameter of the base of the broad V-shaped central reduced portion of the rolled workpiece,

V_k is the width of each of the inclined side surfaces of the broad V-shaped reduced central portion of the rolled workpiece,

S is the width of the base of the broad V-shaped central portion of the rolled workpiece,

($\doteq$ means approximately equal).

4,181,002

TOOLS FOR BENDING SHEET METAL

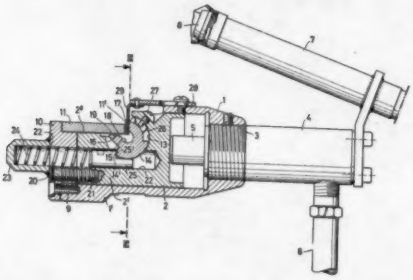
Gerd-Jürgen Eckold, St. Andreasberg, and Hans Maass, Bad Lauterberg, both of Fed. Rep. of Germany, assignors to Walter Eckold Vorrichtungs u. Geräitebau Sperrluttertal, St. Andreasberg, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 825,916

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642549

Int. Cl.² B21D *5/04*

U.S. Cl. 72—387 **11 Claims**



1. A tool for bending a sheet metal workpiece, the tool comprising:

a first former-member mounted for rotational movement about a first axis,

a second former-member arranged adjacent the first former-member to allow a sheet metal workpiece to be inserted between the first and second former-members for bending,

mounting means mounting the first and second former-members to allow one at least of the former-members to move towards and away from the other along a second axis, the first axis being transverse to the second axis,

force-applying means to force the said one at least of the former-members towards the other along the second axis, and

a respective bending profile provided on each of the former-members, the profiles being such that when, in use, the two former-members are forced together with a sheet metal workpiece intervening the first former-member is caused to rotate about the first axis and in so doing bends a part of the workpiece to a predetermined shape defined by the profiles, each profile includes a clamping portion and a bent-shape defining portion, the clamping portion of the first former-member comprising two faces at an angle corresponding to the angle of rotation of the first former-member in use, and the clamping portion of the second former-member comprising a face arranged to be parallel to one of the faces on the first former-member when the first former-member is in an initial position before it rotates to bend a workpiece and to be parallel to the other of the faces on the first former-member when the first former-member is in a final position after bending a workpiece.

4,181,003

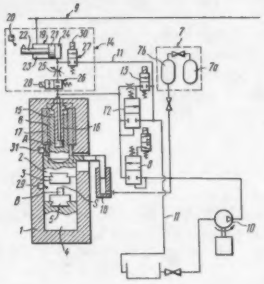
HYDRAULIC SCREW PRESS DRIVE

Ivan V. Kononov, ulitsa Torpedo, 40, kv. 4; Mikhail P. Makushin, ulitsa Oleko Dundicha, 7, kv. 15; Dmitry I. Polukhin, ulitsa Geroev Sibiryakov, 23, kv. 59; Vyacheslav E. Popov, ulitsa Peshestreletskaya, 125, kv. 76, and Viktor P. Salov, ulitsa Zhelyabova, 17, kv. 123, all of Voronezh, U.S.S.R.

Filed Sep. 12, 1978, Ser. No. 941,592

Int. Cl.² B21J *9/16*

U.S. Cl. 72—441 **2 Claims**



1. A drive of a hydraulic screw press comprising: a power cylinder; a movable member of said power cylinder, connected with a press slide; a chamber of said power cylinder; a pneudraulic accumulator incorporating a hydraulic chamber communicating with said chamber of the power cylinder, a source of pressure, and a pneumatic chamber; an inlet valve which puts said chamber of said power cylinder in communication with the hydraulic chamber of said pneudraulic accumulator; a discharge valve through which said chamber of the power cylinder communicates with a low-pressure hydraulic line; a control element of said discharge valve; a device for actuating said discharge valve comprising a pneudraulic cylinder and a piston rod which incorporates an underpiston pneumatic chamber constantly communicating with a pneumatic line, and an above-piston hydraulic chamber which can communicate alternately with said chamber of the power cylinder and said low-pressure hydraulic line; a limit switch of said device for

actuating the discharge valve, connected with the control element of the discharge valve and installed in the extreme position of the free end of the pneudraulic piston rod in which its above-piston hydraulic chamber is in communication with the chamber of said power cylinder.

4,181,004

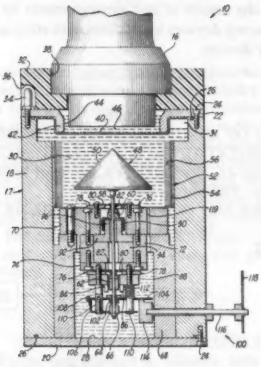
ULTRASOUND WATTMETER

Francis I. Dominy; Leslie W. Partridge, both of Janesville, Wis., and Veikko K. Peltola, Chicago, Ill., assignors to The Burdick Corporation, Milton, Wis.

Filed Jan. 17, 1978, Ser. No. 870,135

Int. Cl.[2] G01H *3/10*

U.S. Cl. 73—1 DV **11 Claims**



1. An ultrasound wattmeter for measuring the magnitude of energy radiated by a therapeutic ultrasound applicator comprising:

a sealed housing;

an ultrasound coupling medium in said housing;

a float assembly suspended in said housing and having a null position in the absence of applied ultrasound radiation;

said float assembly including an ultrasound target float, a coil supported by said float and a vane supported by said float, said float assembly further including a support shaft extending downwardly from said float, said coil and said vane being attached at spaced positions along said shaft; and taut band bearing means coupled between said housing and said shaft;

an ultrasound transmitting window in said housing for communicating ultrasonic energy from the applicator to said reflective float for urging said float assembly in one direction;

a magnet mounted on said housing adjacent said coil for urging said float assembly in the opposite direction in response to energization of said coil;

a light source at one side of said vane;

light responsive means at the other side of said vane for providing a position signal corresponding to the position of said float assembly;

a meter providing an indication of the energization level of said coil; and

an energization circuit coupled to said light responsive means and to said coil for energizing said coil to maintain said float assembly in said null position in response to variations in said position signal.

4,181,005

HYDROGEN DETECTOR

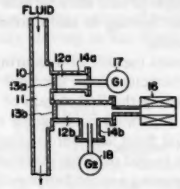
Naomichi Kanegae, and Ichiro Ikemoto, both of Mito, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,804

Claims priority, application Japan, Dec. 6, 1976, 51/146311; Dec. 7, 1976, 51/146789

Int. Cl.[2] G01N *7/10*

U.S. Cl. 73—19 **6 Claims**



1. A hydrogen detector of the type having a metal membrane partitioning the interior of the detector into a fluid section and a vacuum section, wherein two units of said metal membrane are provided and vacuum pipes are provided independently in connection to the respective units of said metal membrane, one of said vacuum pipes being connected to a vacuum gauge for static equilibrium measurement and the other vacuum pipe being connected to an ion pump or a set of an ion pump and a vacuum gauge both for dynamic equilibrium measurement, said metal membrane for static equilibrium measurement being greater in A/d, A being membrane surface area and d being membrane thickness, than said metal membrane for dynamic equilibrium measurement.

4,181,006

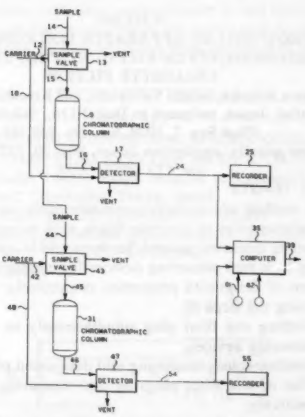
QUANTITATIVE CHROMATOGRAPHIC ANALYSIS WITHOUT CALIBRATION

Donald D. DeFord, Evanston, Ill., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Filed Aug. 31, 1978, Ser. No. 938,588

Int. Cl.[2] G01N *31/08*

U.S. Cl. 73—23.1 **14 Claims**



1. Apparatus for obtaining an analysis of the concentration of at least one individual component of a material comprising:

a chromatographic separation column means;

means for passing a first stream of a first carrier fluid to said chromatographic separation column means at a time t_1 and for passing a first stream of a second carrier fluid to said chromatographic separation column means at a time t_2, said first carrier fluid being different from said second carrier fluid, said time t_2 being later in time than said time t_1;

means for injecting a first sample of said material into the first stream of said first carrier fluid flowing to said chromatographic separation column means and for injecting a second sample of said material into the first stream of said carrier fluid flowing to said chromatographic separation column means;

a detector means capable of measuring a property of a fluid which is characteristic of the fluid;

means for passing the first stream of said first carrier fluid containing separated components of said first sample of said material from said chromatographic separation column means to said detector means as a sample stream and means for passing a second stream of said first carrier fluid to said detector means as a reference stream, said detector means providing a first signal representative of the response R_1 of said detector means when said first stream of said first carrier fluid containing separated components of said first sample and said second stream of said first carrier fluid are provided to said detector means;

means for passing the first stream of said second carrier fluid containing separated components of said second sample of said material from said chromatographic separation column means to said detector means as a sample stream and means for passing a second stream of said carrier fluid to said detector means as a reference stream, said detector means providing a second signal representative of the response R_2 of said detector means when said first stream of said second carrier fluid containing separated components of said second sample and said second stream of said second carrier fluid are provided to said detector means;

means for establishing a third signal k, which is a constant dependent on said property of said first carrier fluid, said property of said second carrier fluid, and the sensitivity of said detector means; and

means for producing a fourth signal in response to said first signal, said second signal, and said third signal, said fourth signal being representative of the concentration of said at least one individual component of said material.

4,181,007

METHOD AND AN APPARATUS FOR CONDUCTING MEASUREMENTS OF PHYSICAL PROPERTIES OF CIGARETTE FILTERS

Katsuharu Arisaka; Seiichi Kobayashi, and Kiyoshi Higashio, all of Sakai, Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Sep. 7, 1978, Ser. No. 940,341
Claims priority, application Japan, Sep. 20, 1977, 52-112124
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—37.8 **6 Claims**

1. A method of conducting measurements on at least two physical properties of cigarette filters, such as resistance to air permeation, diameter, weight, hardness and length thereof, by using at least two measuring devices for conducting the measurement of designated properties, respectively, said method comprising the steps of:

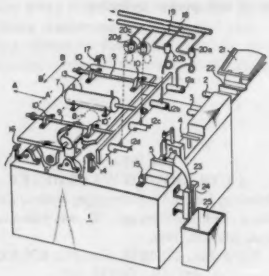
(a) feeding one filter plug simultaneously to each of said measuring devices;

(b) simultaneously measuring said designated physical properties of said filter plugs by said measuring devices, respectively;

(c) simultaneously removing said filter plugs from said respective measuring devices after measurement;

(d) simultaneously feeding the removed filter plugs, except for one removed from the last measuring device, to the subsequent measuring devices, while feeding a fresh filter plug to the first measuring device;

(e) repeating said procedures, and;



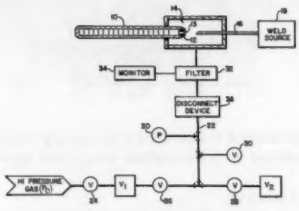
(f) scanning the results of said measurements by said respective measuring devices in succession to store said results in a memory device.

4,181,008

METHOD OF ASSURING NUCLEAR FUEL ROD PRESSURIZATION DURING MANUFACTURE

Clarence D. John, Jr., Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 18, 1978, Ser. No. 907,215
Int. Cl.[2] G01M *3/32*
U.S. Cl. 73—52 **5 Claims**



1. A method of determining whether a nuclear reactor fuel rod is charged with a gas comprising the steps of:

inserting an end of a fuel rod loaded with nuclear pellets in a plenum chamber of known volume, said fuel rod being sealed at one end and having an end plug in the other end equipped with an opening which establishes communication between the plenum chamber and the interior of the fuel rod;

temporarily sealing said rod in the walls of said chamber;

charging a first container of known volume with an inert gas from a high-pressure source and then isolating said first chamber from said source;

discharging gas from said first container into the plenum chamber and from the plenum chamber through said end plug opening and into the interior of said fuel rod; and,

observing a pressure sensor connected to the system which according to the equation $P_1V_1=P_2V_2=-P_nV_n$ will indicate either a high or low reading according to whether the fuel rod has been charged with gas from the plenum chamber;

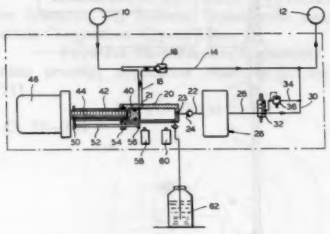
closing the hole in said end plug by a weld in the event the sensor displays the lower of two readings; and,

removing said fuel rod from the plenum chamber in the event said sensor displays the higher of two readings.

4,181,009
APPARATUS FOR COUNTING PARTICLE CONTAMINATION IN A LIQUID

William A. Williamson, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 24, 1978, Ser. No. 899,662
Int. Cl.[2] G01N 15/00
U.S. Cl. 73—61.4 18 Claims

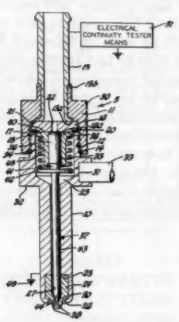


1. Apparatus for counting particle contamination in a liquid comprising liquid conduit means which includes a liquid chamber, a piston adapted to operate in said chamber, spaced conduit opening means in said chamber, means for actuating said piston to cover one of said opening means subsequent to which actuation of said piston exhausts a measured volume of pressurized liquid from the other opening means, counting means connected to said conduit means for counting the particles in said measured volume of liquid, and valve means in said conduit means for establishing a predetermined liquid conduit pressure in said counting means when said piston actuating means is actuated.

4,181,010
INJECTION TIMING NOZZLE

Richard S. Knape, and Richard A. Moreau, both of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1978, Ser. No. 920,144
Int. Cl.[2] G01M 15/00
U.S. Cl. 73—119 A 6 Claims

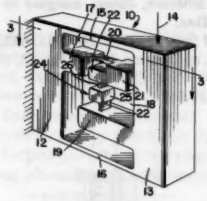


1. A fuel injection nozzle including a nozzle housing having a spray tip body of electrically conductive material at one end thereof and operatively connectable to one end of an electrical test circuit, said nozzle housing having an inlet for pressurized fuel, a spray outlet means at the free end of said spray tip body and a valve seat in said spray tip body next adjacent said spray outlet means; an injection valve of electrically conductive material positioned in said nozzle housing for movement between a closed position at which said injection valve engages said valve seat and an open position at which said injection valve is lifted off said valve seat; and spring means including a spring and an abutment means fixed to said nozzle housing with said spring being operatively connected to said abutment housing means and to said injection valve to normally bias said injection valve to said closed position, said abutment means being operatively connectable to the opposite end of an electrical test circuit and includes an insulating means operatively positioned to electrically insulate a portion of said abutment means from said nozzle housing whereby to operatively insulate said spray tip body from said injection valve when said injection valve is in said open position whereby said injection valve is operable as the movable contact of an electrical switch with said spray tip body serving as the fixed contact of the electrical switch.

4,181,011
LOAD CELL

Albert E. Brendel, Lake Orion, Mich., assignor to Maatschappij van Berkel's Patent N.V., Rotterdam, Netherlands

Filed May 11, 1978, Ser. No. 904,978
Int. Cl.[2] C01L 1/22
U.S. Cl. 73—141 A 13 Claims

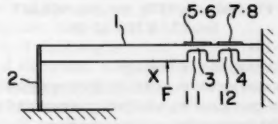


9. A load cell comprising spaced apart first and second end constraints, a pair of spaced apart parallel stabilizer flexures connected to their ends to the end constraints to form a parallelogram, a stress sensing beam extending parallel to said stabilizer flexures and having a first end supported by one of the end constraints at a point between said stabilizer flexures and a second end, and load directing flexure means extending between the other of said end constraints and said second end of said sensing beam including an enlarged sensing beam end constraint having a leg underlying at least half of the sensing beam and a load directing flexure depending from said leg along a centerline extending perpendicular to and intersecting the midpoint of said sensing beam the lower end of which is connected to a projection extending from the other of said end constraints.

4,181,012
DEVICE FOR CONVERTING MECHANICAL QUANTITIES INTO ELECTRICAL QUANTITIES

Mitsuhiro Kiuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Nagano Keiki Seisakusho, Tokyo, Japan

Filed Aug. 29, 1978, Ser. No. 937,892
Claims priority, application Japan, Aug. 31, 1977, 52-104487
Int. Cl.[2] G01L 5/00
U.S. Cl. 73—141 A 6 Claims



1. In a device for converting mechanical quantities into electrical quantities of the class having a strain-exhibiting element, resistance strain gages secured to the strain-exhibiting

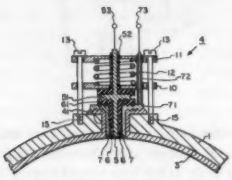
element, means for applying a mechanical quantity in the form of a mechanical force to the strain-exhibiting element, and means including said strain gages and producing an electrical quantity in response to and corresponding to said force, the improvement wherein: the strain-exhibiting element is a cantilever bar having near the fixed end thereof two strain-exhibiting parts possessing amply lower rigidity than the other parts of the bar and being spaced apart but close to each other in tandem alignment in the longitudinal direction of the bar, the bar being further supported at a point thereof remote from said strain-exhibiting parts and fixed end in a manner permitting the bar at said point to undergo displacement in the longitudinal direction thereof but prohibiting the same from being displaced in a direction parallel to that of said force; the strain gages are respectively secured to the bar on the same surface thereof at said strain-exhibiting parts; and means are provided to vary the point on the bar at which the force is applied.

4,181,013

ELECTRODES FOR AN ELECTROMAGNETIC FLOW METER

Norikazu Wada, Ichihara, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 13, 1977, Ser. No. 832,872
Claims priority, application Japan, Jul. 23, 1976, 51-97534[U]
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **8 Claims**



1. An electrode structure comprising
a center electrode,
an electrically insulating tube surrounding a portion of said center electrode,
an outer electrode surrounding a portion of said tube and
clamping means for compressing said center electrode and outer electrodes against said insulating tube wherein said center electrode includes a first radially outwardly extending collar, said outer electrode includes a second radially outwardly extending collar and said tube includes a third radially outwardly extending collar located between said first and second collars and said clamping means is arranged to urge said first and second collars against said third collar.

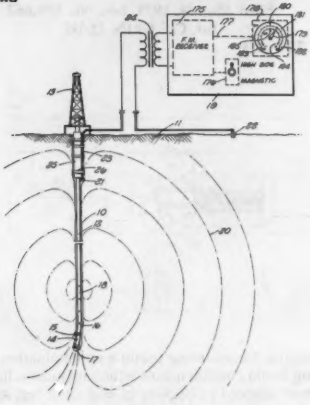
4,181,014

REMOTE WELL SIGNALLING APPARATUS AND METHODS

Bernard R. Zuvela; Raymond W. Teys, both of Fountain Valley, and Richard A. Johnson, Long Beach, all of Calif., assignors to Scientific Drilling Controls, Inc., Irvine, Calif.

Filed May 4, 1978, Ser. No. 902,687
Int. Cl.[2] E21B *47/00*
U.S. Cl. 73—151 **39 Claims**

1. The combination comprising:
transmitter coil means at a first location within a well operable when energized by oscillating current to induce current in the surrounding earth formation;
a first electrode contained in the earth in electrical contact with the earth formation at a level spaced beneath the upper surface of said formation;
a conductor which extends upwardly from said first electrode through the earth formation and which is insulated from said formation;
a second electrode electrically connected to the earth and located farther from said coil means than is said first electrode; and



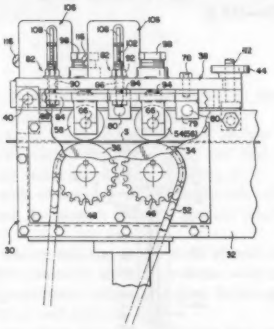
a signal receiving unit at an upper location connected to said first electrode through said conductor, and connected to said second electrode, and responsive to differences in potential between the two electrodes induced by said coil means.

4,181,015

SHEET MATERIAL FLAW DETECTOR

James W. Jensen, and Stanley J. Miller, both of Hastings, Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 2, 1978, Ser. No. 930,549
Int. Cl.[2] G01B *5/20*
U.S. Cl. 73—159 **22 Claims**



1. A device for detecting increases in surface height of a moving sheet of material comprising, frame means, a first roll supported for rotation by said frame means, bracket means pivotally mounted on said frame means, a second roll mounted on said bracket means for pivotal movement therewith and for rotation relative thereto, said second roll being parallel to said first roll and supported by said bracket means for movement toward and away from said first roll, biasing means between said bracket means and frame means biasing said second roll toward said first roll, said second roll having axially opposite ends, adjustable stop means between said bracket means and frame means adjacent each said opposite ends of said second

roll for adjusting the position of said second roll to space said second roll from said first roll a distance corresponding to the thickness of said sheet material, and roll deflection detector means between said bracket means and frame means adjacent each said opposite ends of said second roll responsive to a predetermined displacement of said second roll away from said first roll.

4,181,016

PROCESS AND APPARATUS FOR TESTING HYDRAULIC CONTROL SYSTEMS

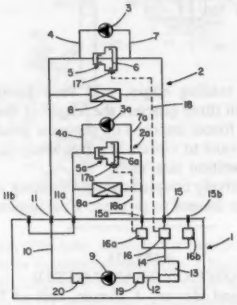
Walter Schapink, BA Bussum, Netherlands, assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed Jul. 11, 1978, Ser. No. 923,567

Claims priority, application Netherlands, Jul. 11, 1977, 7707711

Int. Cl.[2] G01M *19/00*

U.S. Cl. 73—168 **7 Claims**



1. Apparatus for the simultaneous testing of one or more hydraulic control systems, each system having a hydraulic pressure pump whose high-pressure end is connected to a first tank in which a piston element having a relatively small surface is movable and whose low-pressure end connected to a second tank in which a sealing element, which has a relatively large surface and is coupled with the piston element, is movable in such a way that under normal working conditions a constant compression ratio is maintained in the system, each individual system including at least one working unit between the high-pressure end and the low pressure end while, for use on a test unit with a pressure pump of its own, its high-pressure end is connected to the high-pressure end of each system to be tested and the low-pressure end is connected by way of a tank to the low-pressure end of each system to be tested, at least one pressure regulator for each system connected between the tank in the test system and the low-pressure end to be tested; said pressure regulator acting in dependence of the position of the corresponding piston elements coupled with each other to maintain the compression ratio in each individual system at the value conforming to normal working conditions.

4,181,017

FAULT DETECTING APPARATUS FOR FLUID PRESSURE SYSTEMS

Charles R. Markle, 12242 McDaniel, Alsip, Ill. 60658

Filed Aug. 7, 1978, Ser. No. 931,611

Int. Cl.[2] G01F *1/20*; G01L *7/00*

U.S. Cl. 73—168 **9 Claims**

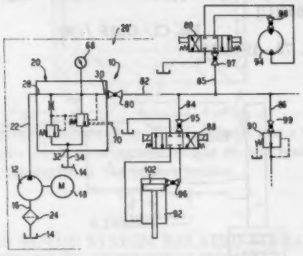
1. A fault detecting apparatus for fluid pressure operated systems providing means to identify a malfunction in at least one component in the fluid pressure operated system comprising:

a fluid pressure operated system having motion producing means included therein,

a fluid pressure source adapted to pressurize said fluid pressure operated system to operate the motion producing means,

fluid control means for a related motion producing means included in the fluid pressure operated system to regulate said motion producing means,

separate fluid blocking valves provided with each of said fluid control means and said motion producing means to selectively isolate a related motion producing means from the remainder of the fluid pressure operated system,



a pressure indicating means incorporated in the fluid pressure operated system, and

a flow indicating means incorporated in the fluid pressure operated system whereby each of the motion producing means and fluid control means may be individually checked for malfunction by alternately operating an associated fluid blocking valve and observing the pressure and flow indicating means for fault indications.

4,181,018

UNITARY ELECTROMAGNETIC FLOWMETER

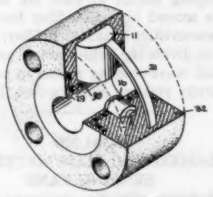
Roy F. Schmoock, Richboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Division of Ser. No. 771,420, Feb. 23, 1977, Pat. No. 4,098,118.

This application Jun. 29, 1977, Ser. No. 811,276

Int. Cl.[2] G01F *1/58*

U.S. Cl. 73—194 EM **4 Claims**



1. An electromagnetic flowmeter unit comprising:

A. An annular pressure vessel molded of insulation material to define a central flow passage having a longitudinal axis, said vessel being molded about an insulating shell which lines said passage, said shell being reinforced by a non-magnetic reinforcing spool surrounding said shell;

B. A pair of electromagnets embedded in said vessel at diametrically-opposed positions with respect to said passage, each electromagnet having a coil wound about a ferromagnetic core which lies along a diametrical axis extending at right angles to said longitudinal axis;

C. a pair of electrodes embedded in said pressure vessel at diametrically-opposed positions with respect to said passage, said electrodes lying along a transverse axis at right angles both to said diametrical and to said longitudinal axis; and

D. a ferromagnetic strap embedded in said vessel and inter-

connecting the outer ends of said cores to provide a magnetic return path therefor.

4,181,019
ELECTROMAGNETIC FLOWMETER WITH NOISE COMPENSATION

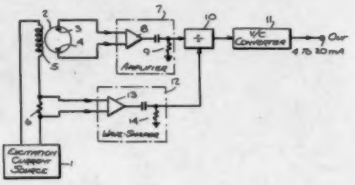
Tamotsu Kobayashi, Yokohama; Kazuie Suzuki, Tokyo, and Takashi Torimaru, Musashino, all of Japan, assignors to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,739

Claims priority, application Japan, Sep. 22, 1977, 52/127630[U]

Int. Cl.[2] G01F *1/60*

U.S. Cl. 73—194 EM **7 Claims**



1. In an electromagnetic flowmeter provided with a flow tube through which the fluid to be metered is conducted to intercept a magnetic field established by an electromagnet having an excitation coil to induce a signal voltage in a pair of electrodes disposed in the tube, which signal voltage is a function of flow rate and is accompanied by an objectionable D-C noise voltage, the combination comprising:

A an excitation circuit to apply a low-frequency rectangular wave to said coil whose frequency is lower than the frequency of a standard A-C power line to produce an excitation current;

B means interposed in the excitation circuit to derive therefrom a comparison voltage which varies in accordance with said excitation current;

C amplifier means to pass the signal voltage accompanied by said noise voltage through a first high-pass filter to eliminate said noise voltage, said first filter introducing an error in said signal voltage;

D wave-shaping means to pass the comparison voltage through a second high-pass filter having essentially the same characteristics as said first filter; and

E a divider to divide the output of said amplifier means with that of said wave-shaping means to compensate for said error, thereby yielding an error-free signal voltage.

4,181,020
VORTEX-SHEDDING FLOWMETER HAVING A SENSING VANE

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Sep. 21, 1978, Ser. No. 944,624

Int. Cl.[2] G01F *1/32*

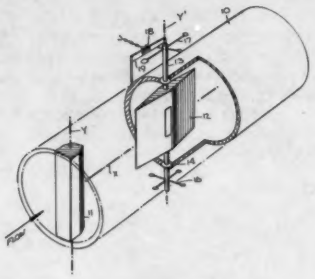
U.S. Cl. 73—194 VS **10 Claims**

1. A vortex-shedding flowmeter comprising:

A. a flow tube through which a fluid to be metered is conducted along the axis of the tube;

B. a shedder having a predetermined geometry transversely disposed in said tube to divide the flow therein and to cause vortices to be shed alternately on either side thereof at a repetition rate proportional to the flow rate of the fluid, thereby producing downstream trains of vortices moving along the right and left sides of the tube, the wave span between the eyes of successive vortices in each train having a substantially constant length determined by said geometry;

C. a vane disposed in said tube between the left and right trains of vortices whereby vortices which pass along the left side of the vane impose forces on the right side thereof and vortices which pass along the right side of the vane impose forces on the left side thereof, said vane being pivoted on a shaft extending along a pivot axis which is normal to the tube axis, the body of said vane being symmetrical with respect to said pivot axis to define like



leading and trailing edges, said vane having a length which is about three quarters the length of the wave span, whereby the forces imposed on the vane produce torques causing said vane to vibrate at a frequency in accordance with said repetition rate; and

D. means operatively coupled to said vibrating vane to sense the vibrations thereof to produce a corresponding signal.

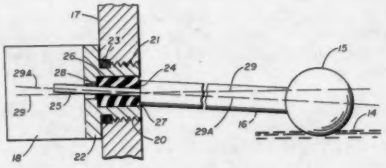
4,181,021
POSITION TRANSMITTER

Lewis K. Harris, and Howard J. Pearse, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 28, 1978, Ser. No. 906,492

Int. Cl.[2] G01F *23/06*

U.S. Cl. 73—317 **4 Claims**



1. Linkage between a displacement element and a signal generator for an analogue of the position of the element, including,

a primary element adapted to be positioned within a range by a variable condition in a container,

an elongated rod member connected by one end to the displaced primary element and extending the second end through the wall of the container,

a device mounted on the outside of the container and to the end of the rod to generate signals which are analogues of the displacer positions and which manifest and/or control the variable condition in the container,

a reduced diameter portion formed on the rod at the wall of the container,

a cylindrical body of elastomeric material arranged about the reduced diameter portion of the rod, one end abutting the rod shoulder formed by the reduced diameter,

a bushing extended through the container wall and having a passage through which the reduced diameter of the rod extends,

and a counterbore in the bushing which provides a shoulder which engages the second end of the cylindrical elasto-

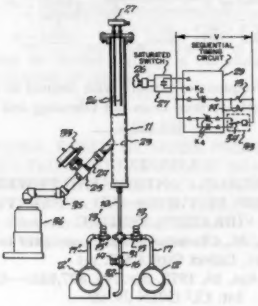
meric body, whereby the elastomeric body deforms to provide a fulcrum at its centroid for the rod in establishing a range of positions for each end of the rod and a force directed to returning the rod to its original position.

4,181,022

PRESSURE RISE TUBE SAMPLER

Jack A. Perry, 920 Mohawk St., Apt. #344, Bldg. #6, Lewiston, N.Y. 14092

Filed Dec. 18, 1978, Ser. No. 970,213
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 TC **3 Claims**



1. A pressure rise tube sampler for liquid comprising first conduit means in communication with a high pressure liquid line, a rise tube coupled to said first conduit means, first valve means for selectively permitting communication between said first conduit means and said rise tube to permit high pressure liquid to enter said rise tube, second conduit means effectively coupled to said rise tube for disposing of liquid from said rise tube, second valve means for selectively permitting communication between said rise tube and said second conduit means, side arm sampler means in communication with said rise tube, first control means for selectively closing said second valve means and opening said first valve means to permit liquid to rise in said rise tube, level sensing means for detecting when liquid has reached a sufficient level in said rise tube to fill said side arm sampler means, second control means coupled to said detecting means for closing said first valve means and opening said second valve means in response to said sensing of said sufficient level by said detecting means to thereby discharge liquid from said rise tube, third valve means in said side arm for selectively permitting discharge of liquid from said side arm, and third control means for opening said third valve means to discharge said liquid therefrom.

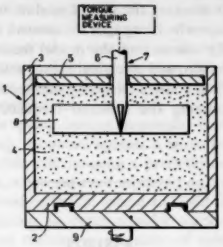
4,181,023

APPARATUS FOR SHORT-DURATION TESTS FOR DETERMINING THE FLOWABILITY OF POWDERS

Rudolf Clamroth; Hans Loske, both of Leverkusen, and Jochen Schnetger, Odenthal-Hoeffe, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,816
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729252
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—432 R **7 Claims**

1. An apparatus for determining the flowability of powders under storage conditions comprising a cylindrical beaker open at the top for receiving a sample of the powder to be tested and a base for enabling the beaker to be disposed in an upright position, at least one loading plate of predetermined weight introducible through the open top to uniformly compress powder received in the beaker, means for rotating the beaker, a sharp resistance element configured to centrally slice into the powder in the beaker after compression by the plate with the



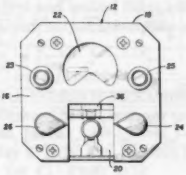
powder then being otherwise free of disturbance, and a torque measuring device for measuring the torque on the resistance element when subsequently the beaker rotates.

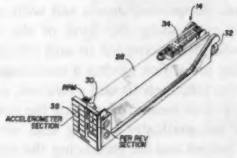
4,181,024

HELICOPTER ROTOR SYSTEM RELATED VIBRATION AMPLITUDE DETECTING SYSTEM

John Leak, Swarthmore, and Aaron Miller, Jr., Aston, both of Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 15, 1978, Ser. No. 933,949
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—660 **16 Claims**





1. A helicopter rotor system related vibration amplitude detecting system, comprising in combination;

at least one vibration amplitude sensing device mounted to the helicopter in the vibrational sphere of the rotor system related vibration, said sensing device generating a signal which is indicative of the amplitude of the rotor system related vibration;

a control unit having a housing including: first selector means; second selector means connected to the first selector means and connectable to each sensing device for selectively, electrically connecting each sensing device to said first selector means, said first selector means serving to selectively receive the generated signal from each sensing device; electrical control means for operating on the selected generated signal and producing an output signal within a selected frequency and amplitude range; display means for displaying indicia of the output signal; a receiving slot for a model module; and mounting means for a connector within the receiving slot; and

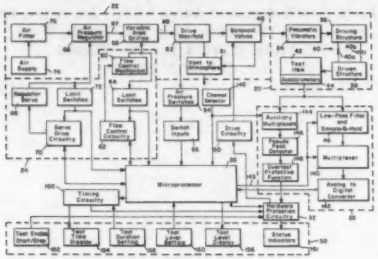
a model module having a housing which is received within the receiving slot, said model module housing including: mounting means which engage the control unit mounting means for securing the model module to the control unit; a connector which engages the control unit connector for electrically connecting the model module to the second selector means; and electrical means selectively applied to the electrical control means by said second selector means for determining the selected frequency and amplitude range.

4,181,025

MEANS FOR ADJUSTING THE AREA OF AN ORIFICE IN A VIBRATION SYSTEM

Henry T. Abstein, Jr., Roseburg, Oreg., and Dennis B. Page, Redondo Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1978, Ser. No. 897,820
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **13 Claims**



2. In a vibration system having means for supporting a test item, pneumatic vibrators coupled to said supporting means and operable therewith for generating quasi-random, simultaneous multi-axis vibration in the test item, and means defining a closed loop with said supporting means and with said vibrators for sensing and controlling the level of the multi-axis vibration, an improved means coupled to said vibrators comprising means defining an orifice having a maximum opening size for flow of air therethrough to said vibrators, and means cooperable with said orifice means for varying the opening size thereof, thereby for automatically causing said vibrators to vary their vibratory output and for enhancing the randomness in the multi-axis vibration.

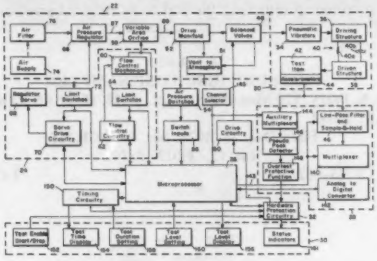
4,181,026

QUASI-RANDOM PNEUMATIC VIBRATION FACILITY AND AUTOMATIC FREQUENCY MODULATING SYSTEM THEREFOR

Henry T. Abstein, Jr., Roseburg, Oreg.; Dennis B. Page, Redondo Beach, Calif.; James M. Kallis, Los Angeles, Calif.; Charles F. Talbott, Jr., Chatsworth, Calif., and Richard L. Baker, Rancho Palos Verdes, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1978, Ser. No. 897,821
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **13 Claims**

12. A method for quasi-randomly varying vibration frequencies applied to a test item comprising the steps of superimposing a number of simultaneously produced vibrations and applying the vibrations to the test item, wherein said superimposing step includes the step of varying the input to means for produc-



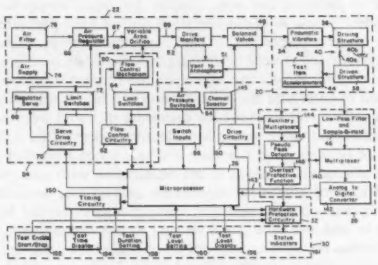
ing the vibration frequencies rapidly with respect to averages of acceleration levels derived from the vibrating test item.

4,181,027

NODAL/MODAL CONTROL AND POWER INTENSIFICATION METHODS AND APPARATUS FOR VIBRATION TESTING

Charles F. Talbott, Jr., Chatsworth, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1978, Ser. No. 897,822
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **31 Claims**



1. A vibration control system including:

a shaker for vibration testing of a test item comprising a driving structure, a driven structure supporting the test item, a visco-elastic structure coupling said driving and driven structures together for establishing vibration modal characteristics of said driving structure and of said driven structure cooperating with said driving structure, and means coupled to said driving structure for imparting vibratory excitations thereto; and vibration controlling means coupled to said shaker and cooperating therewith for controlling characteristic vibratory excitations imparted to said test item by controlled alteration of the modal characteristics.

4,181,028

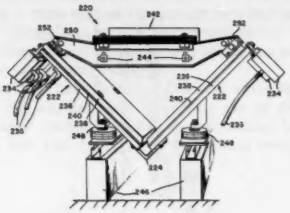
MULTI-AXIS, COMPLEX MODE PNEUMATICALLY ACTUATED PLATE/SPACE FRAME SHAKER FOR QUASI-RANDOM PNEUMATIC VIBRATION FACILITY

Charles F. Talbott, Jr., Chatsworth, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1978, Ser. No. 897,823
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **13 Claims**

1. A shaker for vibration testing a test item comprising a driving structure for producing vibratory excitations, a visco-elastic structure coupled to said driving structure for modify-

ing the vibratory excitations transmitted thereto, and a driven structure coupled to said visco-elastic structure and supporting



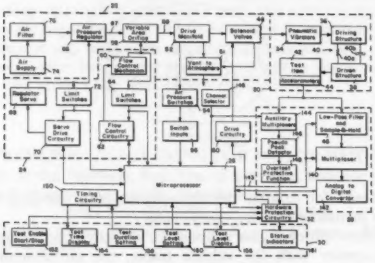
the test item for further modifying the vibratory excitations which are exerted on the test item.

4,181,029

MULTI-AXIS, COMPLEX MODE PNEUMATICALLY ACTUATED ANNULAR FRAME SHAKER FOR QUASI-RANDOM PNEUMATIC VIBRATION FACILITY

Charles F. Talbott, Jr., Chatsworth, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1978, Ser. No. 897,824
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—665 **11 Claims**



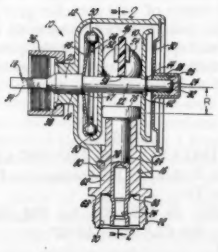
1. A shaker for vibration testing of a test item comprising an annular driving structure, an annular driven structure supporting the test item, a visco-elastic structure coupling said driving and driven structures together, and means coupled to said driving structure for imparting vibratory excitations thereto.

4,181,030

SPEEDOMETER DRIVE ARRANGEMENT

Lubomyr O. Hewko, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,602
Int. Cl.[2] F16H *37/02, 15/08*
U.S. Cl. 74—12 **2 Claims**



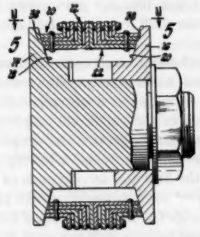
1. For use with a rotatable transmission output, a drive adapter comprising a housing, input and output shafts extending into said housing rotatably mounted in respective openings formed therein, said input shaft having an end extending from said housing adapted to be operatively connected to said transmission output, drive means formed on the exposed end of said output shaft for operatively connecting said output shaft to a member to be driven, a first race forming drive disc means secured to said input shaft in said housing, a belleville spring having a central opening through which said input shaft extends, said belleville spring having an annular shoulder around said central opening, mounted against a shoulder formed on said input shaft within said housing a predetermined distance from said first race, a second race mounted around said input shaft intermediate said belleville spring and said first race, said belleville spring having an outer annular track adjacent the outer circumference thereof, a plurality of spherical thrust bearings for receiving and transmitting the axial spring force of said belleville spring, said bearings being mounted in said outer annular track of said belleville spring and confined between said belleville spring and said second race, a plurality of spacer balls rotatably mounted between said first and second races against the force of said belleville spring, cage means disposed between said races rotatably supporting said spacer balls in said housing, said housing having shoulder means engaging said cage means to retard said cage means from rotation, a roller formed on the inner end of said output shaft and frictionally confined in a traction-drive relationship between said first and second races by said belleville spring, and ratio adjustment means mounted in a wall of said housing and operatively connected to said roller for positioning said roller along the adjacent surfaces of said first and second races and thereby establishing the resultant input/output speed ratio of said shafts.

4,181,031

CHAIN FOR A V-DRIVE ARRANGEMENT

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 8, 1978, Ser. No. 903,714
Int. Cl.[2] F16G *5/18*
U.S. Cl. 74—234 **4 Claims**



1. An elongated power transmitting chain for use with a pair of discs having respective opposite coaxial conical faces constituting a V-pulley, said chain comprising a plurality of right and left-hand sets of L-shaped drive elements, fastener means for rigidly connecting the laterally extending legs of each set of drive elements in an abutting stacked relationshipand such that the vertically extending legs thereof are positioned predetermined distances apart so as to form uniform spaces therebetween, a connector link positioned in each space between adjacent vertically extending legs in an interleaved relationship therewith, two transverse bores formed through the interleaved connector links and vertically extending legs of the two oppositely disposed sets of drive elements, pin means extended through each of said transverse bores, two additional connector links connected at adjacent ends thereof to the respective extended ends of each pair of half pins on each side of said right and left-hand sets of drive elements, said intermediate and

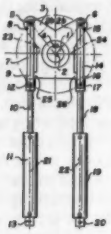
additional connector links interconnecting circumferentially adjacent right and left-hand sets of drive elements, and end faces formed on the ends of the laterally extending legs of each set of drive elements and tapering so as to frictionally engage said opposite conical faces.

4,181,032

STEERING GEAR

William Wagner, 1295 Chartwell Cres., West Vancouver, British Columbia, Canada (V7S 2P9), and Daryl A. Wagner, 1094 Hillside Rd., West Vancouver, British Columbia, Canada (V7S 2E9)

Filed Jul. 25, 1977, Ser. No. 818,366
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—99 R **7 Claims**



1. An apparatus for rotating a shaft about an axis of rotation less than one full revolution, the shaft having a neutral position, the apparatus comprising:

a tiller member connectable to the shaft;

two links, each link having a first end and a second end and being pivotally connected to the tiller member near the first end a radial distance from the axis of rotation, the shaft being generally midway between the ends of each link in the neutral position;

link rotation limiting means connected to the tiller member adjacent each link for preventing rotation of the links towards the shaft from a position of the links in the neutral position;

two fluid cylinders, each cylinder having a first end and a second end, means near the first end for pivotally connecting each cylinder to a corresponding said link near the second end of the corresponding link, each cylinder having means near the second end for pivotally mounting said each cylinder, each cylinder having a line of action colinear with the first and second ends of the cylinder, the line of action of each cylinder in the neutral position being colinear with the first and second ends of the corresponding link and being a distance from the axis of rotation less than said radial distance from the axis to the first end of the corresponding link, the distance from the axis to the line of action of each cylinder increasing when the shaft rotates in each direction from the neutral position so the cylinders exert an increasing torque on the shaft.

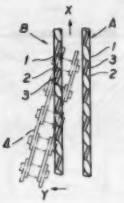
4,181,033

SPROCKET FOR BICYCLES

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 862,239
Claims priority, application Japan, Dec. 28, 1976, 51-175430[U]
Int. Cl.[2] F16H *55/30*
U.S. Cl. 74—243 R **8 Claims**

1. A sprocket for a bicycle which facilitates chain meshing, comprising a body formed as a plate and a plurality of teeth circumferentially provided co-planarly at the outer periphery of said body along the center line of axial thickness of said body, at least one of said plurality of teeth being slanted at its



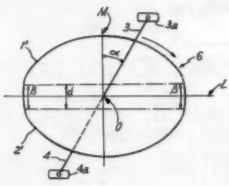
tip with respect to said center line of axial thickness of said body.

4,181,034

CHAIN DRIVE MEANS FOR A BICYCLE OR THE LIKE

Jacques Daniel, 78 Boulevard Gambetta, 29200 Brest, France

Filed Apr. 27, 1978, Ser. No. 900,504
Claims priority, application France, May 3, 1977, 77 13405
Int. Cl.[2] F16H *55/30*; G05G *1/14*
U.S. Cl. 74—243 NC **5 Claims**



1. Means for driving the drive chain of a self-propelled vehicle including a frame, comprising:

(a) a first sprocket gear adapted for rotatable connection at its center with the vehicle frame, the circumferential surface of said sprocket gear including a pair of diametrically opposed peripheral portions each having the configuration of a cycloid, said cycloid peripheral surfaces being radially spaced in the direction of the minor axis of said sprocket gear, the base lines of said cycloids being parallel and spaced on opposite sides of the major axis of said sprocket gear, the circumferential surface of said sprocket gear further including arcs of a circle connecting the adjacent ends of, and substantially tangent with, said cycloid peripheral surfaces, respectively, the diameter of said circle being equal to the length of the major axis of said sprocket gear, whereby the surfaces of the cycloids and the arcs merge smoothly; and

(b) a pair of aligned foot pedal crank arms connected with, and extending diametrically outwardly in opposite directions from the center of, said sprocket gear;

(c) said crank arms being angularly advanced, relative to the minor axis of said sprocket gear, in the power supplying direction of rotation of the sprocket gear by an angle of from about 30° to about 40°.

4,181,035

CONNECTING LINK FOR MINING CHAIN

Thomas D. Shockley, Gahanna, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

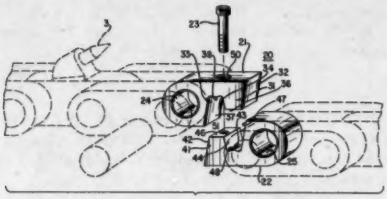
Filed Aug. 29, 1977, Ser. No. 828,396
Int. Cl.[2] F16G *13/02*
U.S. Cl. 74—250 R **2 Claims**

1. A connecting link for a mining chain, comprising:

a first half link having a laterally extending bore for receiv-

ing a link connecting pin of the chain, a tapered projection spaced from said bore and extending perpendicular to the chain pitch line across the width of said half link and having a cross section comprising two inclined sidewalls converging along an axis also perpendicular to the chain pitch line, and an opening in said projection along the axis of said converging sidewalls;

a second half link having a laterally extending bore for receiving another link connecting pin of the chain, an elongated recess extending perpendicular to the chain pitch line and having a cross section comprising two



inclined sidewalls diverging along an axis also perpendicular to the chain pitch line, and an opening in said recess along the axis of said diverging sidewalls;

whereupon joining said two half links the projection of the first half link seats snugly in the recess of the second half link with the sidewall of the projection in mating contact with the corresponding sidewalls of the recess such that said pin receiving bores are aligned parallel to each other and the openings in said projection and said recess are co-axially aligned; and

means insertable in said aligned openings to fasten said first and second half links rigidly together.

4,181,036

STEPPED-RATIO GEARING FOR MOTOR VEHICLES

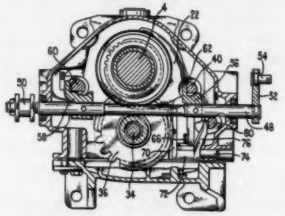
Fritz Janke, Nauheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1978, Ser. No. 908,963

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723761

Int. Cl.² G05G *5/10*

U.S. Cl. 74—477 **9 Claims**



1. Stepped-ratio gearing for motor vehicles, comprising individual forward-ratio gears which are rotatably mounted on a rotary mainshaft and are in constant mesh with countershaft gearing to be driven thereby at differing speeds, coupling means which are mounted for rotation with said mainshaft and are selectively movable for synchronized engagement of a plurality of forward ratios including a fourth forward ratio, a shift fork selectively movable in the direction of a fourth-ratio position for synchronized engagement of a fourth forward ratio by the action of said coupling means, a reverse-ratio pinion, a manually operable selector shaft, a shift member selectively movable by said selector shaft to slide said reverse-ratio pinion into meshing engagement with one of said forward-ratio gears and with said countershaft gear means for engagement of a reverse ratio, and motion-transmitting means constituted by a spring-loaded entrainment detent that is pivotally mounted on said selector shaft or on a part movable therewith and, on movement of said selector shaft for selection of said reverse ratio, exerts a camming action upon an oblique surface arranged on said shift fork or on a part movable therewith, to thereby displace said shift fork in the direction of its fourth-ratio position by a pre-synchronization amount effective to achieve noiseless synchronized engagement of said reverse ratio.

4,181,037

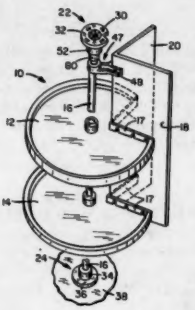
LAZY SUSAN ASSEMBLY HAVING AN ADJUSTABLE ALIGNMENT MECHANISM

Daniel A. Boon; R. Larry Jones, and Naaman Shelton, Jr., all of Louisville, Ky., assignors to Jones Plastic & Engineering Corporation, Jeffersontown, Ky.

Filed Aug. 24, 1977, Ser. No. 827,231

Int. Cl.² G11B *1/00*; A47F *3/10*; A47B *81/00*; F16H *53/06*

U.S. Cl. 74—569 **12 Claims**



1. An adjustable alignment mechanism for a rotatable lazy susan assembly comprising:

a housing defining a cylindrically shaped cavity,

a raised annular sawtooth like track formed on a cavity defining floor of said housing,

a cylindrically shaped cam gear having a plurality of teeth extending from the side of said gear and having an annular sawtooth like base comforming to said track, said gear being slidably disposed on said track,

adjusting threaded means rotatably attached to said housing and operatively engaging said teeth for rotating said gear on said track to raise and lower said gear in said cavity, and

a rotatable member fixedly connectable to said assembly for rotational movement in unison therewith, said member being supported by said gear in slidable relation therewith, whereby adjustment of said threaded means produces raising and lowering of said assembly.

4,181,038

DEVICE FOR DAMPING VIBRATIONS IN ROTORS OF TURBOMACHINES

Bernard Becker, Mulheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,722

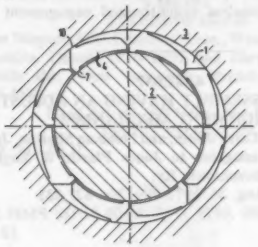
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729340

Int. Cl.² F16F *15/14*

U.S. Cl. 74—574 **10 Claims**

1. In a device for damping vibrations in a rotating turbomachine rotor formed of an assembly of a plurality of centrally apertured rotor discs force-lockingly clamped together by a tie-rod passing through the apertures of the rotor discs and damping elements disposed in a ring slot formed between the

tie-rod and the inner periphery of the rotor discs, the damping elements being actuatable for damping vibrations in the rotor in dependence upon centrifugal force generated by the rotating rotor, the improvement wherein the damping elements are formed of ring segments uniformly distributed peripherally in the ring slot and having discrete, strip-like contact surfaces at



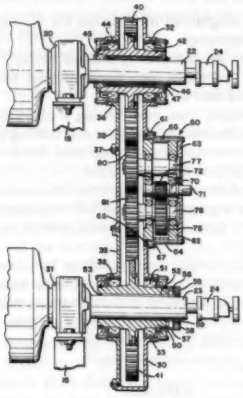
radially inner and outer peripheral surfaces thereof, said contact surfaces being in contact with the tie-rod and the rotor discs, respectively, said contact surfaces being spaced from one another in longitudinal direction of the respective damping elements and in a region of the respective damping elements beyond which the center of gravity of the respective damping elements is located.

4,181,039

DRYER UNIT FOR WEB DRYER SECTION

Richard W. Phelps, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Nov. 3, 1977, Ser. No. 848,115
Int. Cl.[2] F16H *37/06*; F26B *11/08*
U.S. Cl. 74—665 GA **8 Claims**



1. A gear drive unit for driving a pair of parallel shafts spaced a predetermined distance apart, comprising

(a) a main gear case proportioned to receive said shafts through opposite end portions thereof,

(b) a pair of main gears mounted for rotation in said end portions, respectively, of said gear case in properly spaced relation to receive said shafts therethrough,

(c) means for connecting said main gears in driving relation with said shafts respectively,

(d) an input transmission housing mounted on said gear case intermediate the axes of said main gears and rotatable about a central axis equidistant from and parallel to said main gear axes,

(e) a pair of parallel stub shafts journalled in said housing in eccentric parallel relation with said central axis and including portions projecting into said gear case,

(f) an input shaft journalled in said housing and adapted for connection to a drive motor,

(g) a drive pinion secured on said input shaft,

(h) an intermediate gear secured on one of said stub shafts in driven engagement with said drive pinion,

(i) a pair of intermediate gears one each secured on a respective one of said projecting portions of said stub shafts in meshing engagement with each other, and

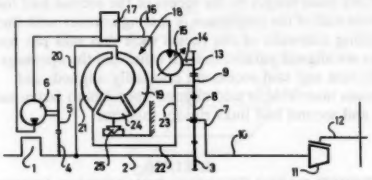
(j) means for securing said transmission housing to said gear case in angularly adjusted position about said central axis wherein said pair of intermediate gears are in driving engagement with said main gears respectively.

4,181,040

INFINITELY VARIABLE SPEED GEAR DRIVE

Hans Hofmann, Munich, Fed. Rep. of Germany, assignor to Getrag Getriebe- und Zahnradfabrik GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,243
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647240
Int. Cl.[2] F16H *47/08*
U.S. Cl. 74—677 **4 Claims**



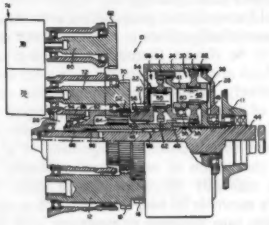
1. A variable speed ratio reversible gear drive for interposition between a prime mover such as an internal combustion engine or the like, and a consumer such as a drive axle or the like comprising a planetary gear system having a sun gear driven by said prime mover, a planet gear meshing with said sun gear and fixed to a carrier driving said consumer and an internal gear meshing with said planet gear, a variable speed torque transmission unit having an output driving said internal gear and a hydrodynamic converter having an impeller driven by said prime mover and a turbine driving said internal gear.

4,181,041

DUAL PATH, DUAL RANGE TRANSMISSION

Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 18, 1977, Ser. No. 788,176
Int. Cl.[2] F16H *47/04, 3/44*
U.S. Cl. 74—687 **12 Claims**



1. A transmission comprising in combination:

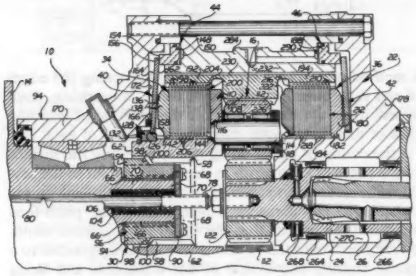
a. first planetary means having operatively interconnected first, second, third and fourth elements;
b. a variable speed control shaft connected to rotate and be rotated by said first element;
c. a variable speed device connected with said control shaft to provide means for controllably varying the rotative speed of said control shaft;
d. a first shaft connected to rotate and be rotated by said third element;
e. said fourth element being in constant mesh with said second element;
f. means for moving said first element into mesh with said second element when the pitch line velocity of said second element, relative to said third element, is substantially the same as the pitch line velocity of said first element, and out of mesh with said second element when said first and second elements are rotating under load; and
g. means for rotating said fourth element and consequently said second element when said first element is not in mesh with said second element, said means for rotating also rotating said second element when said first element is in mesh with said second element and said control shaft is rotating at a selected speed relative to the speed of said second element.

4,181,042

DRIVE ASSEMBLY

Jim L. Rau, and Mark R. Kinder, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 13, 1976, Ser. No. 750,137
Int. Cl.[2] F16D *13/52, 25/00;* F16H *3/44, 35/00*
U.S. Cl. 74—750 R **18 Claims**



1. A drive assembly for use in driving a driven member, said drive assembly comprising a casing, a planetary gear assembly disposed within said casing, said planetary gear assembly including a sun gear, a ring gear, a planet carrier, and a planet gear on said planet carrier connected with said sun and ring gears, input means for effecting rotation of at least one of said gears, output means connected with said planetary gear assembly for effecting rotation of the driven member, said output means including a first section connected with said planet carrier and a second section to be connected with the driven member for rotation therewith, brake means operable from an engaged condition to a disengaged condition, said brake means being effective in the engaged condition to hold said first output section and said one gear against rotation relative to said casing, said brake means being effective in the disengaged condition to enable said first output section and said one gear to be rotated relative to said casing, and clutch means operable between an engaged condition interconnecting said first and second output sections and a disengaged condition enabling said second output section to be rotated relative to said first output section and said casing when said brake means is in said engaged condition, said clutch means including a clutch member encircling said second section and movable between a first position engaging said first and second output sections and a second position spaced from one of said output sections, spring means for urging said clutch member toward said first position and retaining means for retaining said clutch member in said second position against the influence of said spring means, said retaining means comprising a rod having a threaded connection with said clutch member and which upon rotation thereof in one direction effects movement of said clutch member to said second position due to said threaded connection and retains said clutch member thereat.

10. A drive assembly for use in driving a driven member, said drive assembly comprising a casing, a planetary gear assembly in said casing, said planetary gear assembly comprising a rotatable sun gear, a rotatable ring gear, a rotatable planet gear connected with said sun and ring gears, and a planet carrier supporting said planet gear for movement relative to said ring gear about the axis of rotation of said sun gear, input means for effecting rotation of at least one of said gears, output means connected with said planetary gear assembly for effecting rotation of the driven member, clutch means operable between an engaged condition holding said planet carrier and ring gear against movement relative to each other and a disengaged condition in which said clutch means is ineffective to hold said planet carrier and ring gear against movement relative to each other, said clutch means being rotatable relative to said casing about the axis of rotation of said sun gear with said planet carrier and ring gear when said clutch means is in said engaged condition, and a disc spring operable between an active condition urging said clutch means to the engaged condition and an inactive condition in which said disc spring is ineffective to urge said clutch means to the engaged condition, said disc spring being spaced from said casing and acting between a first bearing surface area on said planet carrier and a second bearing surface area on said clutch means when said disc spring is in the active condition to enable said disc spring to rotate relative to said casing with said planet carrier and clutch means, said disc spring being spaced from said planet carrier and clutch means and acting against a third bearing surface area on said casing when said disc spring is in the inactive condition to enable said planet carrier and first clutch means to rotate relative to said disc spring when said disc spring is in the inactive condition, and means for moving said disc spring between its active and inactive conditions.

4,181,043

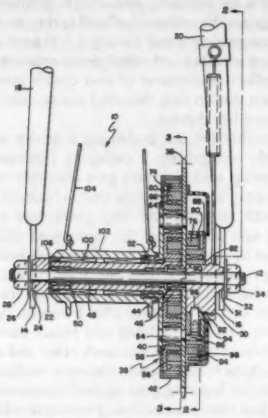
STEPLESS VARIABLE STROKE DRIVE HAVING A NON-ROTATING CAM

Clive Waddington, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Sep. 26, 1977, Ser. No. 836,727
Int. Cl.[2] E16H *3/44*
U.S. Cl. 74—750 B **52 Claims**

1. A stepless variable stroke drive comprising:
a carrier housing journaled on a spindle for rotation about the axis of the spindle, said carrier being operatively connected to means for rotatably driving said carrier;
at least one crank ring mounted in the carrier for rotation about an axis radially offset from the axis of the spindle, said crank ring having a follower rotatably mounted on a pin extending outward therefrom;
a cam plate mounted on the spindle for selective pivotal movement through various positions of eccentricity relative to the axis of the spindle; cam channel constructed on said cam plate in a position to receive the crank follower and to cause the crank ring to angularly oscillate with an amplitude which varies directly proportional to the cam channel eccentricity when the carrier is rotated;
means connected to the cam plate to selectively vary the eccentric position thereof;
first means operatively connected to the crank ring for selectively transmitting the angular motion thereof;
second means operatively connected to the carrier and the crank ring transmitting means to receive motion thereof

and to transmit the summation of the motions of said carrier and said crank ring; and



an output mechanism operatively connected to the second transmitting means.

4,181,044

DRIVE TRANSMISSION SYSTEM

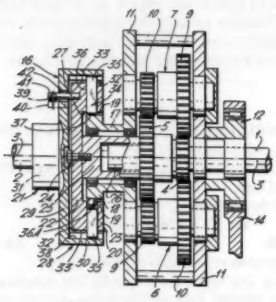
Reginald R. Read, 48, Fairway, Hemel Hempstead, Hertfordshire, England

Filed May 4, 1977, Ser. No. 793,853

Claims priority, application United Kingdom, May 4, 1976, 18287/76

Int. Cl.[2] F16H *3/74*

U.S. Cl. 74—752 E **5 Claims**



1. A drive transmission system including a supporting structure; input and output driving shafts supported for rotation in the structure in alignment on a common axis; an input sun gear secured to the input shaft; an output sun gear secured to the output shaft; a housing mounted for rotation about the common axis; at least one idler shaft supported in the housing; a pair of planet gears both secured to the idler shaft and meshing respectively with the input and output sun gears, the relative sizes of the sun and planet gears being selected to provide a step-down gear ratio from input to output; a free-wheel unit between the housing and the supporting structure arranged to restrain the housing from rotation in a direction opposite that of the input shaft; and a coupling responsive to the output load between the housing and the output shaft, the coupling including a cylindrical first member secured to the housing, the cylindrical axis of the member coinciding with the common axis; a cup-like flanged second member secured to the output shaft, the second member having a flange portion extending in an axial direction over the peripheral cylindrical surface of the first member, the interior surface of the flange portion having at least one cam-shaped recess extending in a peripheral direction; means for supporting a wedge member in alignment between the recess of the second member and the periphery of the first member, the supporting means being displaceable in a circumferential direction relative to the second member from one position in which the shape of the recess causes the wedge member to engage both first and second members to a second position in which the wedge member is completely free from such engagement and means for biassing the support means in a direction opposite that of rotation of the driving shafts to bring the wedge member into said one position.

4,181,045

METHOD FOR WORKING SAW TEETH

Vladimir V. Idel, Mukachevsky raion, selo Kolchino, ulitsa Kirova, 11, Zararpatskaya oblast, U.S.S.R.

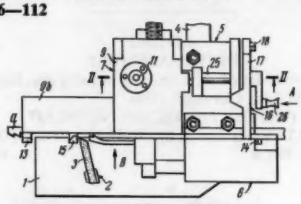
Division of Ser. No. 781,016, Mar. 24, 1977, Pat. No. 4,112,789.

This application Jun. 29, 1978, Ser. No. 920,203

Claims priority, application U.S.S.R., Mar. 30, 1976, 2333521

Int. Cl.[2] B23D *63/00*

U.S. Cl. 76—112 **1 Claim**



1. A method of working saw teeth by sharpening the edges thereof and subsequently setting said teeth, comprising: feeding the saw to an abrasive wheel for the purpose of grinding the edges of each saw tooth; grinding the edges of each saw tooth; in the course of the grinding process heating the surface layer of the edges of each tooth to the melting point of the saw material; subsequently imparting the saw a pitch-feed movement relative to the abrasive wheel; during the pitch-feed movement of the saw bending the tip of each ground tooth, said tip being heated in the course of the grinding process to a temperature slightly above that of hot brittleness and being bent by bringing the side surface thereof in contact with the appropriate shaped surface of a tooth tip supporting element, whereby the setting of saw teeth is performed only in the zone of the tips.

4,181,046

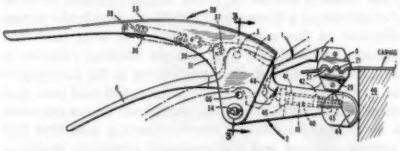
HAND-HELD CANVAS STRETCHING APPARATUS

Terrence R. Lamb, 3549 S. St. N.W., Washington, D.C. 20007

Filed Mar. 16, 1978, Ser. No. 887,376

Int. Cl.[2] B25B *7/00*; B66F *3/00*

U.S. Cl. 81—5.1 R **13 Claims**



1. A clamping device for stretching a canvas about a frame member comprising in combination; first and second opposing jaw-carrying members connected by means of a pivot pin; said first jaw-carrying member comprising an elongated arm hav-

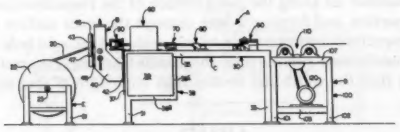
ing first, intermediate and second end portions and having an upper jaw pivotally secured to said first end portion thereof; said second jaw carrying member comprising a plate-like structure having first and second ends and having two parallel side walls formed on said second end thereof which define a groove for receiving the intermediate portion of said first jaw-carrying member; and having a lower jaw pivotally mounted to said first end thereof; a primary handle member mounted to said second jaw-carrying member; a locking mechanism slidably mounted within an aperture formed in said first end of said second jaw-carrying member, said locking mechanism, when placed in contact with the frame about which the canvas is to be stretched, being caused to be forced inwardly and to press against a shoulder formed on said intermediate portion of said first jaw-carrying member whereby upon a downward swinging motion of said primary handle member, the jaw secured to said first jaw-carrying member is caused to be rotated clockwise and into a tightly clamping and locked relationship with the opposing jaw formed on said second jaw-carrying member.

4,181,047

CABLE STRIPPING APPARATUS

James L. Bitting, and Thomas L. Tubb, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 25, 1978, Ser. No. 872,070
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **10 Claims**



1. An apparatus for stripping or removing the outer insulating casing from a multi-wire armor covered, lead jacketed, insulated flat electrical cable comprising:

a. support means;

b. feeding means on said support means for feeding the cable into a stripping means;

c. said stripping means being fixed on said support means for receiving the cable from the feeding means, said stripping means having a plurality of cutting means for longitudinally cutting the cable in a plurality of places of predetermined depths and a plurality of die means for successively stripping the armor, lead jacket and insulation from the wires of the cable; and,

d. pulling means adjacent said support means for pulling the cable through the stripping means.

4,181,048

FLANGE TURNING TOOL

Ralph L. Norton, 2443 Agostino Dr., Rowland Heights, Calif. 91478

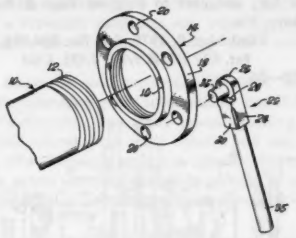
Continuation of Ser. No. 721,893, Sep. 9, 1976, abandoned. This application May 26, 1978, Ser. No. 909,837
Int. Cl.[2] B25B *13/02*
U.S. Cl. 81—90 C **4 Claims**

1. A tool for turning a flange having a central axis, a peripheral surface and at least one axially extending opening, said flange turning tool comprising:

a body portion,

a pin extending outwardly from a recessed surface of said body portion adapted to engage in one of said flange openings,

a thrust shoulder on the body portion confronting and spaced from the pin to define recess means for receiving a portion of the flange extending between the opening and the periphery, and



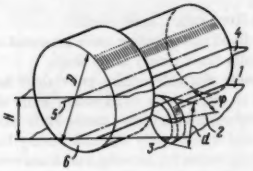
handle means extending from said body portion for rotating the tool.

4,181,049

METHOD OF MACHINING SOLIDS OF REVOLUTION BY ROTARY CUTTING TOOLS AND A TOOLHOLDER FOR CARRYING SAME INTO EFFECT

Alexandr V. Borisenko, Leninsky prospekt, 127, kv. 178; Evgeny A. Serebryakov, ulitsa Chervyakova, 95/26, kv. 1; Anatoly F. Sakun, ulitsa Kalinovskogo, 57, kv. 4, all of Minsk, and Valentin T. Bazin, ulitsa Bulatnikovskaya, 11, kv. 58, korpus 1, Moscow, all of U.S.S.R.

Filed Mar. 31, 1978, Ser. No. 892,036
Claims priority, application U.S.S.R., Apr. 4, 1977, 2470335; May 12, 1977, 2484455
Int. Cl.[2] B23B *3/00*; B26D *1/12*; B23B *29/00*
U.S. Cl. 82—1 C **2 Claims**



1. A method of machining solids of revolution by a rotary tool whose effective portion is shaped as a solid of revolution held on a spindle and having a circular cutting lip, said solid of revolution being imparted rotation during the cutting process, resides in that the tool axis is set in the plane parallel to the basic plane passing through the axis of machine centres, and at an angle to the projection of the axis of centres on said plane, whereas the distance from said plane of the tool axis to said basic plane and said angle of the tool axis position are selected from the following relation:

$$H=(D/2)\sin\omega+(d\ tg\omega/2\sqrt{\sin^2\phi+tg^2\omega})$$

where

H is the distance from the plane of the tool axis to the basic plane passing through the axis of machine centres;

D is the diameter of the workpiece being machined;

d is the diameter of the circular cutting lip;

ω is the central angle of setting the tool point with respect to the basic plane;

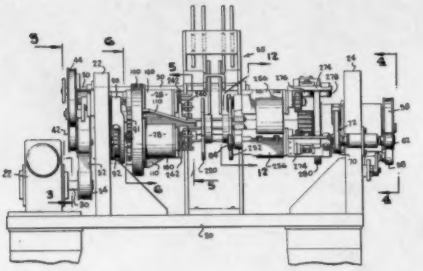
ϕ is the angle of setting the tool axis with respect to the projection of the axis of machine centres on the plane of the tool axis.

4,181,050

CAN CUTTING APPARATUS AND METHOD

Alphonse Stroobants, Lynchburg, and Daniel S. Cvacho, Forest, both of Va., assignors to Belgium Tool & Die Company, Lynchburg, Va.

Filed Mar. 9, 1978, Ser. No. 884,981
Int. Cl.[2] B23B *3/06, 7/00, 3/04*
U.S. Cl. 82—56 **18 Claims**



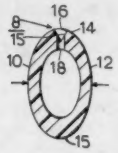
1. A can end trimmer comprising:
frame means;
an elongated main support shaft mounted for rotation on said frame means;
a source of power;
power transmission means extending between said source of power and said main support shaft;
a removable cutter unit cartridge removably mounted on said main support shaft for unitary attachment thereto or removal therefrom, said cutter unit cartridge including:
a housing;
an axially fixed rotary knife shaft;
an axially fixed rotary cutter knife mounted on one end of said axially fixed rotary knife shaft;
a transversely shiftable rotary knife shaft having an axis parallel to said axially fixed rotary knife shaft;
a transversely shiftable rotary cutter knife mounted on one end of said transversely shiftable rotary knife shaft;
shaft shifting means for moving said transversely shiftable rotary knife shaft to effect movement of said transversely shiftable cutter knife into and out of cutting permitting engagement with said axially fixed rotary cutter knife;
coupling transmission means extending between said axially fixed rotary knife shaft and said transversely shiftable rotary knife shaft for effecting rotation of said cutter knives in unison;
shaft actuator means mounted for reciprocation on said main support shaft in a direction parallel to the axis of said main support shaft and engaged with said shaft shifting means for actuating said shaft shifting means;
means for reciprocating said shaft actuator means parallel to the axis of said main support shaft in a timed cyclic manner in response to rotation of said main support shaft to resultantly effect timed movement of said transversely shiftable rotary cutter knife into and out of engagement with said axially fixed rotary cutter knife;
a knife driving means on said support shaft drivingly engaged with said axially fixed rotary knife shaft for effecting rotation of said cutter knives; and cyclically operated can feeding, holding and handling means for positioning cylindrical cans to be trimmed in cutting position and for discharging said cans following the completion of the trimming operation.

4,181,051

METHOD OF MAKING FLUID-ISSUING OPENINGS THROUGH THE WALLS OF FLEXIBLE PLASTIC MEMBERS, PARTICULARLY DRIPPER EMITTERS

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Dec. 13, 1977, Ser. No. 860,193
Int. Cl.[2] B26D *7/14*
U.S. Cl. 83—19 **12 Claims**



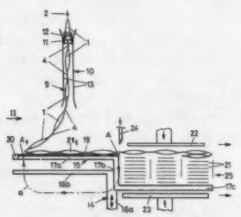
1. The method of making drip emitter openings through the wall of a water conduit used for drip irrigation by forming each opening through a small radius of curvature portion of the conduit wall while the respective wall portion is of curved oblong shape in cross-section, such that during use of the conduit, it assumes a circular shape, thereby increasing the radius of curvature of said wall portion and reducing the cross-sectional area of the outer part of the opening formed therethrough, characterized in that each of said openings is formed by squeezing the conduit wall to deform same, forming a longitudinal slit along the outer surface of the respective conduit portion, and forming a hole through the inner surface of the respective conduit portion to join with said slit, said hole in the undeformed condition of the conduit having a diameter larger than the width and smaller than the length of said slit.

4,181,052

APPARATUS FOR STACKING FILLED BAGS

Georg Kopp, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

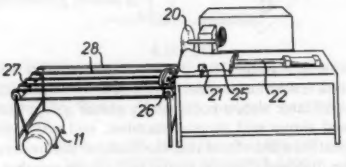
Filed Mar. 13, 1978, Ser. No. 885,897
Claims priority, application Switzerland, Mar. 11, 1977, 3126/77
Int. Cl.[2] B65H *31/32, 31/10*
U.S. Cl. 83—79 **9 Claims**



1. An apparatus for stacking filled flat bags advanced thereto in at least one coherent row forming a bag web of indeterminate length, comprising
(a) advancing means for continuously feeding the bag web vertically downwardly;
(b) orienting means for imparting on the downwardly advancing bag web a continuous back-and-forth oscillating motion;
(c) a collecting means situated below said orienting means in the path of the bag web for receiving the bag web in a stack formed of zigzag-folded layers;
(d) synchronizing means for coordinating the operational speed of said advancing means with that of said orienting

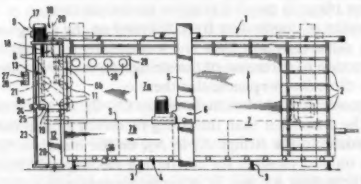
means for determining the length of the zigzag-folded layers of the stack deposited on said collecting means;
(e) first drive means for moving said collecting slide periodically upwardly and downwardly;
(f) a conveying means arranged adjacent the vertical traveling path of said collecting slide;
(g) a feeding slide arranged for displacement between and into effective zones of said collecting slide and said conveying means;
(h) second drive means for periodically moving said feeding slide to transfer from said collecting slide to said conveying means the stack accumulated on said collecting slide during the downward motion thereof; and
(i) cutting means situated between said traveling path of said collecting slide and said conveying means for severing the layers of the stack on said conveying means from the bag web subsequent to the transfer of the stack from said collecting slide to said conveying means by said feeding slide.

4,181,053
FOOD SLICERS
John M. Duddridge, Barnham, England, assignor to Danepak Ltd., Norfolk, England
Continuation of Ser. No. 700,987, Jun. 29, 1976, abandoned.
This application Aug. 25, 1977, Ser. No. 827,633
Int. Cl.[2] B26D *4/46*
U.S. Cl. 83—80 **2 Claims**



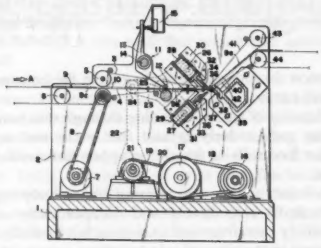
1. Apparatus comprising, in combination, a conveyor for receiving slices of a food stuff as they are cut by a slicer, a pump for generating hydraulic pressure, a motor driven by said hydraulic pressure, means defining a fluid flow path between said pump and said motor, means for drivingly connecting said motor to said conveyor, a preset flow control valve in the flow path between the pump and the motor for limiting the speed at which the said motor drives said conveyor, and means for temporarily by-passing said control valve thereby to increase the fluid flow to said motor to accelerate the motor.

4,181,054
APPARATUS FOR CUTTING PANELS TO SIZE
Ludwig Striebig, Grossmatte, CH-6014 Littau, Switzerland
Filed Apr. 11, 1978, Ser. No. 895,517
Int. Cl.[2] B27B *5/06*
U.S. Cl. 83—153 **13 Claims**



1. In apparatus for cutting panels including a supporting structure defining a vertically extending surface of engagement with a panel to be cut, a horizontally extending panel edge rest downwardly bounding said surface, a saw carrier movable on said structure in a predetermined direction substantially parallel to said surface, a saw unit movable on said carrier in a direction transverse to said predetermined direction in sawing engagement with a panel to said surface, and gripping means for gripping a vertically extending side edge portion of said panel, the improvement in said gripping means which comprises:
(a) guide means on said supporting structure defining a vertically extending path substantially parallel to said transverse direction, said guide means including
(1) a guide column, said guide column and said saw unit being offset from said surface in opposite directions, and
(2) pivot means securing said guide column to said structure for angular movement about a vertically extending axis;
(b) a slide member guided in said path by said guide means; and
(c) clamping means on said slide member including two clamping face portions; and
(d) moving means for moving said face portions toward and away from each other into and out of clamping engagement with said side edge portion.

4,181,055
APPARATUS FOR AUTOMATICALLY CUTTING SHEET MATERIAL
Sinji Miyata, Higashiura, Japan, assignor to Hashimoto Denki Co., Ltd., Aichi, Japan
Filed Aug. 28, 1978, Ser. No. 937,459
Claims priority, application Japan, Feb. 14, 1978, 53/16279
Int. Cl.[2] B27L *5/08*
U.S. Cl. 83—350 **10 Claims**



1. An apparatus for automatically cutting a sheet material comprising a feed conveyor means on which the sheet material to be cut is placed, two fixed blades provided at substantially right angle with each other with a juncture line thereof being in the transverse direction and opposite to the terminal end of said feed conveyor means, two movable cutter blades also provided at substantially right angle with each other opposite to said fixed baldes in such a manner that one of said movable cutter blades coacts with one of said fixed blades and the other movable cutter blade coacts with the other fixed blade to cut said sheet material at substantially right angle with respect to the plane of said sheet material, and means for alternately advancing and retreating said two movable cutter blades at a predetermined timing.

4,181,056
DOUBLE BAY WOODWORKING MACHINE
Edwin H. Zimmerman, R.D. #1, New Holland, Pa. 17557
Filed Aug. 24, 1978, Ser. No. 936,338
Int. Cl.[2] B27C *9/04*
U.S. Cl. 83—360 **12 Claims**

1. A double bay industrial saw system operable to receive timber cants and selectively direct the same respectively to one

or the other bays of said saw system and comprising in combination:

(a) a longitudinal frame, the opposite ends of which comprise a receiving end and a discharge end and feed paths within a common plane extending along opposite sides of said frame,

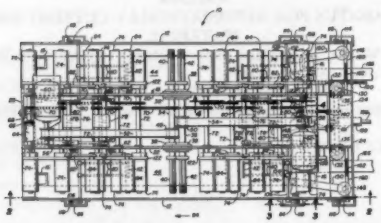
(b) cant-receiving means extending longitudinally outward from said receiving end of said frame within a common horizontal plane respectively aligned with,

(c) cant-delivery means comprising conveyor means operable transversely from one side of said receiving means and operable to feed cants to said receiving means in sequence,

(d) control means operable to dispose said cants selectively in longitudinal alignment with said feed paths along said frame,

(e) a longitudinal housing extending along said frame centrally thereof between said feed paths,

(f) a pair of saw arbors having opposite ends projecting horizontally from opposite sides of said housing in longitudinally and vertically spaced relationship relative to each other and each pair of ends thereof respectively adapted to have one or more cooperating sets of saws mounted thereon for coaction to make complete cuts through said cants by the respective saws of each set forming parts of a



common through cut extending from the bottom and top of said cants,

(g) a plurality of shafts extending through said housing and having ends underlying said feed paths and supporting similar feed rolls of which the upper surfaces define said paths,

(h) sub-frames within said housing respectively supporting short shafts respectively and independently extending oppositely therefrom and extending horizontally through openings in the sides of said housing,

(i) arms extending transversely from the outer ends of said shafts and supporting horizontal pressure rollers on the outer ends of said arms,

(j) power means operable to urge said shafts independently in directions to move said pressure rollers toward said feed rollers and engage the upper surfaces of cants moved by said feed rollers toward, past and from said sets of saws when mounted on said arbors,

(k) control means activated by advancing cants to energize said power means to urge said pressure rollers as aforesaid, and

(l) master power means connected to said shafts supporting said feed rollers and operable to drive all of said shafts and feed rollers simultaneously and continuously while said system is in operation.

4,181,057

PORTABLE RADIAL SAW

Alvin L. Bassett, 2148 SE. 135th St., Portland, Oreg. 97233

Filed Apr. 19, 1978, Ser. No. 897,738

Int. Cl.[2] B27B *5/20*

U.S. Cl. 83—486.1 **4 Claims**

1. A portable radial saw comprising:

a. a table assembly having a horizontally planar top slab,

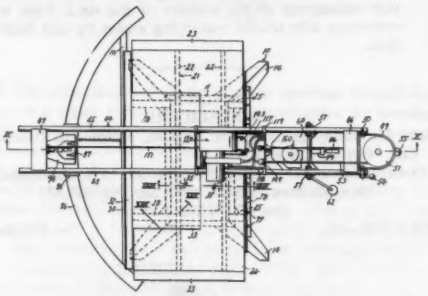
b. an arm extending forwardly and rearwardly across the top slab of said table assembly,

c. front connecting means joining the forward portion of said arm to said table assembly for horizontal pivotal movement above a vertical axis,

d. rear connecting means joining the rearward portion of said arm to said table assembly for horizontal arcuate movement concentric with said front pivotal axis,

e. a saw cradle mounted slidably on said arm for movement therealong to traverse the top slab of said table assembly,

f. a power saw mounted on said cradle and operable to cut a work piece positioned on said table slab beneath said arm as said cradle traverses said table slab,



g. a depth-of-cut gauge device comprising a support member disposed beneath a portion of said arm forwardly spaced from said table slab, a horizontally planar gauge member disposed above said support member, said arm being of sufficient forward extent that the blade of said power saw may be disposed directly above said gauge member, and said blade may be lowered to touch said gauge member by means of said power saw adjustment, and means mounting said gauge member on said support member, whereby the vertical elevation of said gauge member relative to said support member may be adjustably varied.

4,181,058

ELECTRICAL STRING-INSTRUMENT

Noboru Suenaga, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Jun. 10, 1977, Ser. No. 805,353

Claims priority, application Japan, Jun. 10, 1976, 51/68543

Int. Cl.[2] G10D *5/00;* **G10H** *3/08*

U.S. Cl. 84—1.16 **3 Claims**

1. An electrical string-instrument comprising:

N conductive strings $A_1, A_2, \ldots A_N$;

a support member having a major surface including a string receiving surface and stretching the strings A_1 to A_N in opposing relation thereto to extend in substantially the same plane in parallel relation to one another;

a plurality of conductive frets disposed on the string receiving surface, which frets are sequentially disposed in the direction of extension of the strings A_1 to A_N to extend in the direction perpendicular thereto;

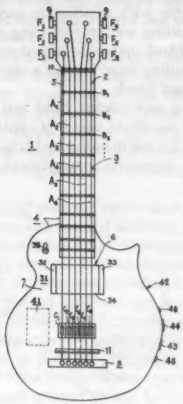
electromechanical transducer means $C_1, C_2, \ldots C_N$ disposed in the area other than the string receiving area in the area opposite to the strings A_1 to A_N on the major surface of the support member for converting mechanical vibrations of the strings $A_1, A_2, \ldots A_N$ into corresponding electrical signals $E_1, E_2, \ldots E_N$, respectively;

magnetic field generating means for generating a constant magnetic field to cover therewith the strings A_1 to A_N;

an electrical circuit for producing feedback signals $M_1, M_2, \ldots M_N$ based on the electrical signals $E_1, E_2, \ldots E_N$

respectively derived from the electromechanical transducer means $C_1, C_2, \ldots C_N$; and

feedback signal supply means for supplying the feedback



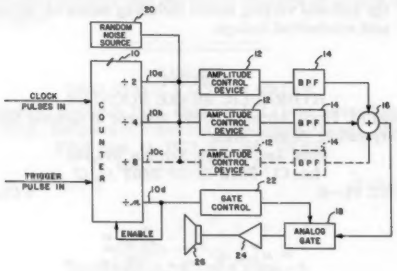
signals $M_1, M_2, \ldots M_N$ to flow feedback currents $I_1, I_2, \ldots I_N$ in those of the strings $A_1, A_2, \ldots A_N$ placed in the constant magnetic field emanating from the magnetic field generating means.

4,181,059

CIRCUIT FOR SIMULATING SOUND OF WIRE BRUSH ROTATED AROUND HEAD OF SNARE DRUM

Christopher M. Weber, Alsip, Ill., assignor to CBS Inc., New York, N.Y.

Filed Apr. 11, 1978, Ser. No. 895,164
Int. Cl.² G10D *13/02*; G10H *5/06*
U.S. Cl. 84—1.24 **10 Claims**



1. In an electronic organ including a loudspeaker, and a rhythm pattern generator including a source of clock pulses having a selectable repetition rate and a source of trigger pulses in timed relationship with said clock pulses, apparatus for generating an electrical signal which when reproduced by said loudspeaker simulates the sound produced when a wire brush is rotated around the head of a snare drum, said apparatus comprising:

at least two signal channels each including a signal amplitude controlling device and a filter,

a source of random noise connected to each of said signal channels,

means including a digital counter having data and trigger input terminals respectively connected to receive clock and trigger pulses from said rhythm pattern generator and a plurality of output terminals two of which are each connected to a respective one of said at least two signal channels, said digital counter being operative in response to said clock pulses to differently control the amplitude controlling device in said at least two signal channels for differently amplitude modulating said random noise signal in each of said noise channels,

means for combining the amplitude modulated filtered noise signals from said at least two signal channels to produce a composite output signal, and

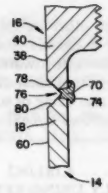
means for applying said composite output signal to said loudspeaker for a period corresponding to the period of a predetermined number of said clock pulses.

4,181,060

HELICAL ANCHOR

William J. Payne, 1328 Clearview Dr., Greensburg, Pa. 15601

Filed Sep. 29, 1977, Ser. No. 837,809
Int. Cl.² F16B *13/06*
U.S. Cl. 85—64 **13 Claims**



1. A helical anchor comprising in combination:

a connector element having a first end and a second end;

a helical coil surrounding said connector element, said helical coil having a plurality of axially spaced turns including an end turn and a plurality of adjacent turns, said coil adapted to expand radially outwardly into gripping engagement with a side wall into which said anchor is received;

a bearing element;

first connection means rotatably securing said bearing element to said connector element at said first end thereof;

second connection means securing said bearing element to said coil at said end turn thereof, said second connection means being defined by at least one fracturable weld interconnecting said bearing element and said coil;

fracture means associated with said weld to promote the fracture thereof during installation;

expansion means providing for the outward expansion of said end turn of said coil after take-up of said anchor has resulted in the fracture of said weld;

said expansion means also acting to inhibit rotation of said bearing element after fracture of said weld.

4,181,061

FASTENING ELEMENT

Thomas W. McSherry, North Babylon, N.Y., assignor to Mechanical Plastics Corporation, Pleasantville, N.Y.

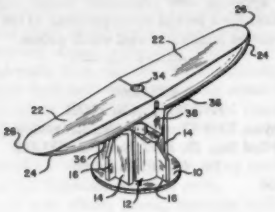
Continuation-in-part of Ser. No. 721,909, Sep. 15, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,865
Int. Cl.² F16B *13/04*
U.S. Cl. 85—80 **19 Claims**

1. In a fastening element for securement within an opening of the type comprising a head portion, a connecting portion for insertion into such opening, and at the end of said connecting portion remote from the head portion, locking means movable between a collapsed position in which the fastening element is insertable into such opening and an expanded position in which said locking means is effective in cooperation with an elongated retaining element inserted into the connecting portion to preclude removal of said element from such opening, the improvement wherein:

said connecting portion comprises a longitudinally extend-

ing body portion comprising a pair of opposed pillar-like parts; and

said locking means comprises a pair of substantially rigid toggle arms pivotally connected to said pillar-like parts at radial locations substantially adjacent to or within the radius of said body in said expanded position and pivotally



connected to each other on the longitudinal axis of said body portion by a flexible integral strap, whereby the toggle arms are movable toward each other to a collapsed position and away from each other to an expanded position, each toggle arm being of substantially greater length than the cross-sectional dimention of said body portion.

4,181,062

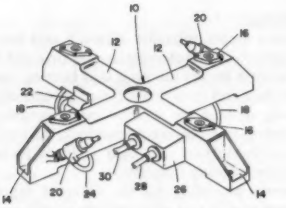
RELEASE ASSEMBLY USING SEPARATION NUTS AND THRUSTERS

Phillip Bernstein, Sunnyvale, and Henry Toy, Los Altos, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 10, 1978, Ser. No. 922,907

Int. Cl.[2] F41F *5/02*; B64D *1/04*

U.S. Cl. 89—1.5 F **2 Claims**



2. A method for separating a body from a vehicle comprising the steps of:

(a) actuating a plurality of pairs of separation nuts upon a command, and pairs of separation nuts being manifolded together to provide actuation of both separation nuts of each pair by an energy source, to separate said body from said vehicle; and

(b) thrusting said body with a pair of thrusters simultaneous with said command, said thrusters being manifolded together to use one energy source, to impart spin and a velocity increment to said body.

4,181,063

PANTOGRAPH MACHINE

Arthur A. Burry, 77 Howard St., Penthouse 2, Toronto, Ontario, Canada

Filed Aug. 23, 1977, Ser. No. 827,181

Claims priority, application United Kingdom, Aug. 23, 1976, 35058/76

Int. Cl.[2] B23C *1/18*

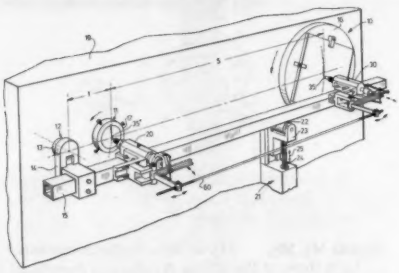
U.S. Cl. 409—88 **3 Claims**

1. A pantograph machine for producing a copy of a master model which comprises: a first centre; a tracing station; and a cutting station;

said tracing station including means for holding and rotating said master model and a tracing head having a tracing stylus engageable with an adjacent surface of said master model, said cutting station including means for holding and rotating a blank upon which said master is to be reproduced and a cutting head having a cutting tip for cutting said copy on said blank;

means for moving said tracing head and said cutting head through a first arc about said first centre;

individual means for maintaining said tracing stylus and said cutting tip in respective engagement with the master



model and blank respectively, means for translating movement of said tracing stylus in a lateral direction into movement of said cutting tip in a corresponding direction,

means for imparting a rotary cutting motion to said cutting stylus; and means for varying the relative travel of said cutting tip and said tracing stylus in a lateral direction to vary, the depth of cut of said cutting tip on said blank relative to the depth of cut on said master model;

said moving means comprising a bar pivoted at said first center and upon which the tracing head and cutting head are mounted, said translating means comprising a mechanical linkage between the tracing apparatus and the cutting tip, and said varying means including means for adjusting said mechanical linkage.

4,181,064

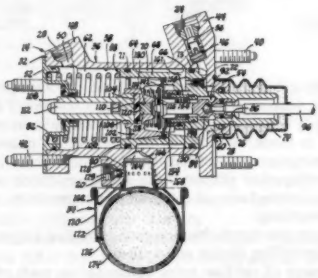
HYDRAULIC BRAKE BOOSTER

Donald M. Flory, Arcanum, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1978, Ser. No. 894,146

Int. Cl.[2] F01B *25/02*; B60T *13/12*

U.S. Cl. 91—6 **6 Claims**



1. A hydraulic booster valve unit for use in a hydraulic booster with a primary source of hydraulic pressure and an accumulator providing a secondary source of hydraulic pressure, said valve unit comprising:

a valve housing also formed as a booster power piston and

having a stepped bore therein defined by a side wall and shoulders, said valve housing being adapted to receive hydraulic fluid from the primary source of hydraulic pressure on one side thereof, said one side defining a wall of a booster power chamber;

a valve sleeve reciprocably received in said bore and having one end exposed to said power chamber, said one end having an outer peripheral section forming a valve element cooperating with a first shoulder and adjacent wall portion of said stepped bore to define a first valve, and an inner peripheral edge forming a control valve seat, said valve sleeve having another end axially opposite said one end;

a first spring acting on said valve sleeve and urging said valve sleeve one end toward said first shoulder;

a valve plunger extending into said stepped bore and having a control valve element formed thereon and cooperating with said control valve seat to define a second valve, said valve plunger having a second spring urging said control valve element axially away from said control valve seat so that said second valve is an open center valve allowing hydraulic fluid to flow therethrough, said valve plunger being adapted to be moved under operator control against the force of said second spring to variably restrict and close said second valve;

said valve housing and said valve sleeve between the ends thereof defining a chamber adapted to contain hydraulic accumulator pressure;

and a third valve adapted to permit hydraulic fluid flow only in one direction between said power chamber and said accumulator pressure chamber;

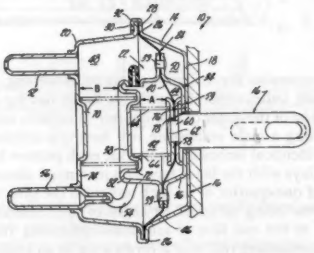
movement of said valve plunger actuating said second valve and conditioning it to restrict hydraulic flow therethrough and increase pressure in the power chamber to actuate the booster, and additional movement of said valve plunger engaging said control valve element and said control valve seat in mechanical force transmitting relation and mechanically moving said valve sleeve to open said second valve to condition said second valve to admit accumulator pressure into the power chamber to actuate the booster.

4,181,065

TWO STAGE VACUUM BREAK

Benjamin C. Benjamin, Flint, and Leon F. LaVene, Durand, both of Mich., assignors to Schmelzer Corporation, Durand, Mich.

Filed Mar. 11, 1977, Ser. No. 776,533
Int. Cl.[2] F15B *11/18*
U.S. Cl. 91—167 R **7 Claims**



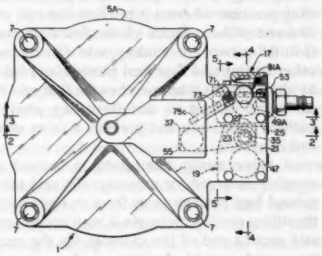
1. A fluid motor device comprising; a primary housing, an auxiliary housing disposed in said primary housing, a diaphragm, said diaphragm having a primary portion supporting said auxiliary housing for movement in said primary housing and forming a first actuating chamber at one side and a first constant pressure chamber at the other side of said auxiliary housing and primary diaphragm portion, said diaphragm having an auxiliary portion in said auxiliary housing forming a second actuating chamber at one side and a second constant pressure chamber at the other side of said auxiliary portion, said first and second actuating chambers being isolated from each other, and being disposed at the same side of said diaphragm said first actuating chamber being connected to one source of variable pressure, condiut means associated with said primary and auxiliary housing and connecting said second actuating chamber to another source of variable pressure, said first and second constant pressure chambers being in continuous communication with a source of constant pressure, and power output means including a first output member connected to said auxiliary portion for movement relative to said primary housing upon establishment of variable pressure in a selected one of said actuating chambers and a second output member connected to said auxiliary housing for movement upon establishment of variable pressure in said second actuating chamber.

4,181,066

EXPANSIBLE CHAMBER MOTOR

Clarence E. Kitchen, Bridgeton, and Jerome B. Wegmann, St. Louis County, both of Mo., assignors to McNeil Corporation, Akron, Ohio

Filed Feb. 10, 1978, Ser. No. 876,574
Int. Cl.[2] F01L *25/06, 31/02*
U.S. Cl. 91—306 **12 Claims**



1. An expansible chamber motor comprising:

a cylinder having first and second end heads;

a motor piston reciprocable in the cylinder between said end heads;

valve mechanism for the motor comprising

air passage means having a valve face at one side of the cylinder, a central exhaust port and first and second feed ports on opposite sides of the exhaust port, with said ports in line endwise of the motor, a first feed passage in communication at one end with the first feed port and at its other end with a first end of the cylinder, and a second feed passage in communication at one end with the second feed port and at its other end with the second end of the cylinder;

a valve chest extending along said valve face having first and second aligned piston-receiving bores at its opposite ends with a chamber between said bores for air under pressure;

a valve actuator movable axially in said chest, said valve actuator having a central portion and first and second pistons at the ends of said central portion slidable in said first and second piston-receiving bores, said pistons at their inner ends being exposed to pressure air in said chamber;

said chamber being in restricted communication with the outer ends of said bores;

a D-valve movable with the actuator and slidable on said valve face, said D-valve being movable with the actuator between a first position wherein it provides for communication of pressure air from said chamber through the first feed port via said first feed passage to said first end of the cylinder, and for exhaust of air from the second end of the

cylinder via the second feed passage, the second feed port and the D-valve to the exhaust port for driving the motor piston in the direction from the first to the second end head, and a second position wherein it provides for communication of pressure air from said chamber through said second feed port via said second feed passage to said second end of the cylinder and for exhaust of air from the first end of the cylinder via the first feed passage, the first feed port and the D-valve to the exhaust port, for driving the motor piston in the opposite direction;

a first exhaust passage for exhausting air from the outer end of the first piston-receiving bore;

a second exhaust passage for exhausting air from the outer end of the second piston-receiving bore;

a first exhaust valve for the first exhaust passage operable by the piston as the piston approaches said second end of the cylinder for exhausting air from the outer end of the first piston-receiving bore thereby to move the actuator to move the D-valve from the first to the second position;

a second exhaust valve for the second exhaust passage operable by the piston as the piston approaches said first end of the cylinder for exhausting air from the outer end of the second piston-receiving bore, thereby to move the actuator to move the D-valve from the second to the first position;

first valve means comprising a first throttle valve member mounted for a movement in said other end of said first feed passage away from an open position toward a throttling position wherein it restricts the exit of air from said first end of the cylinder via the first feed passage, said first throttle member extending into the cylinder from said other end of said first feed passage and being engageable by the piston as it approaches the first end of the cylinder for being moved to said throttling position thereby to cushion the piston and prevent it from striking said first end head; and,

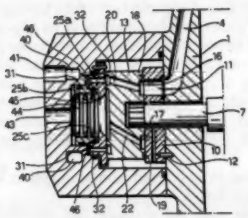
second valve means comprising a second throttle valve member mounted for movement in said other end of said second feed passage away from an open position toward a throttling position wherein it restricts the exit of air from said second end of the cylinder via the second feed passage, said second throttle member extending into the cylinder from said other end of said second feed passage and being engageable by the piston as it approaches the second end of the cylinder for being moved to said throttling position thereby to cushion the piston and prevent it from striking said second end head.

4,181,067

DISTRIBUTOR FOR HYDRAULIC MOTORS

Aurelis Ortelli, Bologna, Italy, assignor to Riva Calzoni S.p.A., Milan, Italy

Filed Feb. 17, 1978, Ser. No. 878,645
Claims priority, application Italy, Feb. 17, 1977, 20386 A/77
Int. Cl.[2] F01B *1/06*
U.S. Cl. 91—485 **5 Claims**



1. Distributor for hydraulic motors, in particular for radial-piston hydraulic motors, comprising:

(a) a hollow housing laterally secured to the motor casing coaxially with one end of the driving shaft extending inside the cavity of said housing;

(b) a distributor plate connected to said end of the driving shaft and rotating therewith inside the cavity of said housing;

(c) a plurality of ducts on said plate cyclically communicating at one end, with the feeding and discharge ducts of the radial pistons of the motor and, at the other end, with corresponding ducts for feeding and discharging the hydraulic fluid under pressure;

(d) a pair of sleeve like tubular elements telescopically disposed relative to each other and located between said distributor plate and the wall of said housing coaxially with the rotation axis of the shaft of the motor, each of said sleeve like tubular elements having on its external periphery an annular step which engages corresponding annular steps on said wall of the fixed housing;

(e) means for securing said sleeve like tubular element to said housing which prevent it from rotating while permitting it an axial displacement;

(f) a plurality of holes on said sleeve like tubular element in the intermediate area between said two steps, said holes communicating at the one side with a first feeding or discharge duct in the wall of the fixed housing and, at the other side, with an annular groove on said distribution plate, the axial cavity of said sleeve like tubular element communicating, at one end, with a second feeding or discharge duct on the wall of the housing and, at the other end, with a cavity on the opposite surface of the distribution plate; and

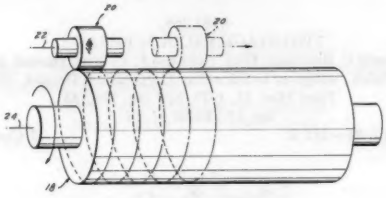
(g) elastic means for pressing said sleeve like tubular element against said distribution plate.

4,181,068

APPARATUS FOR PRODUCING PAPER TOWELS

Stephen F. Pollock, Palatka, Fla., assignor to Hudson Pulp & Paper Corp., Darien, Conn.

Filed Oct. 14, 1977, Ser. No. 842,161
Int. Cl.[2] B31B *1/14*
U.S. Cl. 93—1 A **1 Claim**



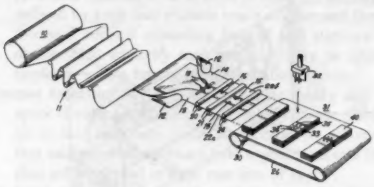
1. Apparatus for embossing paper towelling to produce lands and valleys therein, with the lands having a maximum dimension of the order of one-quarter of an inch, said apparatus comprising a male embossing roll having a continuous spiral row of identical embossing patterns, each pattern having lands and valleys with the lands having a maximum dimension of the order of one-quarter of an inch and with the direction of each spiral row being offset at an angle of approximately 5° with respect to the end face of said male embossing roll, a mating female embossing roll which forms a nip in an embossing zone, and means to pass a continuous strip of paper towelling through said nip between said male embossing roll and said mating female embossing roll, whereby each of the embossing patterns in said male and female embossing rolls forms one of said lands in the paper towelling such that said lands are arranged in parallel rows that are offset with respect to the edge of said paper towelling by approximately 5°, and whereby the paper towelling can be wound into individual rolls with the spiral patterns of the lands offsetting each land from those of the adjacent rows sufficiently to prevent nesting of the lands.

4,181,069

METHOD FOR PRODUCING DOUBLE STREAMS OF SIDE-WELDED BAGS IN HEAT-WELDED PAD FORM

James F. Porter, East Norwalk, Conn., assignor to Chase Bag Company, Greenwich, Conn.

Filed Apr. 28, 1978, Ser. No. 901,187
Int. Cl.[2] B31B *1/64, 23/14*
U.S. Cl. 93—35 R 6 Claims



1. The method of producing bags from a single web of plastic film which is unreeled from a parent roll comprising the steps of:

(a) continuously passing a web of plastic film through a pair of "J" formers which turn the outer edges of the film inwardly toward each other to provide oppositely-disposed "J" folds with the inner edges of the "J" folds spaced from each other and leaving a single ply thickness longitudinally along the film;

(b) continuously perforating the single ply longitudinally and outwardly of the top edge of each "J" fold to provide a line of perforation adjacent each such outer edge;

(c) transversely heat sealing said "J" folded film at spaced distances to provide side-welds for the bags being formed;

(d) severing the semi-finished bags transversely midway of the side-welds;

(e) successively stacking the oppositely-disposed semi-finished bags in a predetermined number;

(f) heat-welding the single ply portion of the open end of each bag to provide two pads of semi-finished bags; and

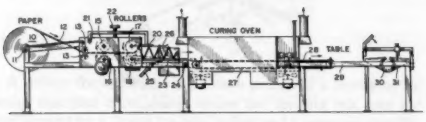
(g) severing the oppositely-disposed pads of semi-finished bags from each other to provide two heat-welded pads of finished bags.

4,181,070

METHOD OF MAKING VARIABLE PLEAT PAPER

Alvin M. Robbins, 6755 South 1495 East, Salt Lake City, Utah 84121, and Paul J. Robbins, 3468 Casino Camino, Salt Lake City, Utah 84119

Filed Feb. 16, 1977, Ser. No. 768,986
Int. Cl.[2] B31D *5/04*
U.S. Cl. 93—60 7 Claims



1. A process for forming pleated paper cylindrical air filters of tight pleats comprising:

(a) conveying a continuous strip of resin impregnated paper to scoring zone;

(b) scoring said paper perpendicularly to the travel of said paper;

(c) Pleating said paper into open pleats;

(d) continuously curing said pleated paper of open pleats to a substantially fully cured state;

(e) cutting said continuous strip of substantially cured pleated paper into appropriate lengths for forming into a cylinder;

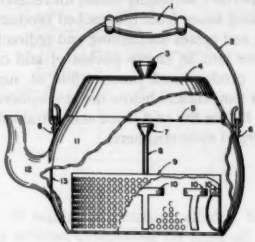
(f) compressing a length of substantially cured pleated paper into a cylinder of tight pleats and inserting said cylinder of cured pleated paper into a porous canister, wherein the pleats in said canister are tighter than said pleats during cutting of the pleated paper.

4,181,071

MODIFIABLE RECEPTACLE TEAPOT

Jeanette M. Outlaw, 423 St. James Ave., Suffolk, Va. 23434

Filed Apr. 3, 1978, Ser. No. 893,043
Int. Cl.[2] A47J *31/18*
U.S. Cl. 99—317 1 Claim



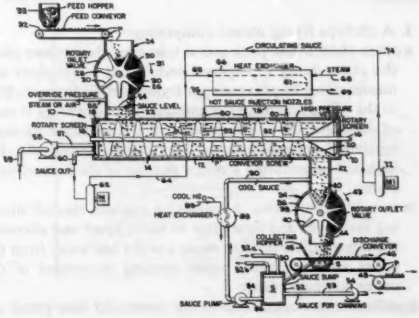
1. A teapot including a tea making chamber having a teabag holding device operationally disposed therein, said teabag holding device being substantially circular in shape and having a substantially cylindrical operationally vertically disposed side wall, said side wall of said teabag holding device carrying a plurality of T-shaped teabag receptacles, each of said teabag receptacles including a horizontal portion having a central section spaced from said side wall of said teabag holding device and end sections each interconnecting said central portion thereof and said side wall of said teabag holding device, each of said teabag receptacles further including a vertical portion having an upper section interconnected with said central section of said horizontal portion thereof spaced from said side wall of said teabag holding device and a lower section interconnecting said upper section thereof and said side wall of said teabag holding device.

4,181,072

CONTINUOUS PRESSURE COOKING APPARATUS

Katsuji Hirahara, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

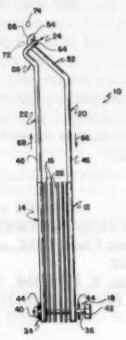
Filed Jun. 6, 1977, Ser. No. 804,115
Int. Cl.[2] A47J *27/04*
U.S. Cl. 99—353 8 Claims



1. Apparatus for continuously cooking raw food products at superatmospheric pressure comprising means for heating a cooking sauce to a temperature in excess of its boiling point at

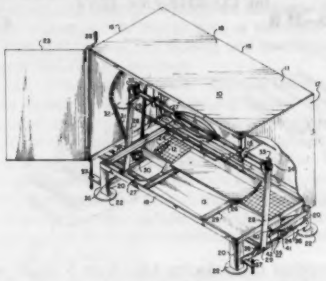
atmospheric pressure; means for circulating the heated sauce; a pressure vessel for receiving a heated volume of the cooking sauce and maintaining said sauce at superatmospheric pressure; said vessel including spaced inlet and outlet apertures; a rotary inlet valve connected to said vessel for delivering raw food product into the cooking sauce to fill said vessel with food product and sauce and directly cook the product in the sauce; a rotary outlet valve connected to said vessel for discharging discrete portions of the sauce and the cooked entrained product therein from said vessel to atmosphere; said discharge valve including separate pockets which sequentially index with said outlet aperture; screening means for receiving and separating the cooking sauce from the cooked product discharged to atmosphere; and means for cooling and redirecting the cooled cooking sauce into an empty pocket of said outlet valve for cooling the product and sauce while at superatmospheric pressure to a temperature below the atmospheric boiling point of the sauce before the said sauce and entrained cooked product is discharged to atmosphere.

4,181,073
CHALUPA FRYING UTENSIL
Abel A. Chapa, Sr., 605 Brock, Corpus Christi, Tex. 78412
Filed Feb. 14, 1978, Ser. No. 877,662
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—416 **7 Claims**



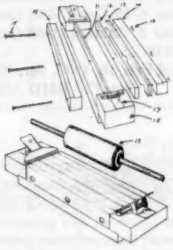
1. A chalupa frying utensil comprising:
a cover plate, a base plate and at least one intermediate plate, the plates being superposed and of flat metal sheet and means aiding in preventing a frying tortilla from sticking to the plates comprising a multiplicity of openings in each of the plates, the openings being of arcuate shape having a maximum dimension in the approximate range of ⅛–178 inch and constituting a minor portion of the area of each plate;
means interconnecting the plates on one end thereof allowing the cover and base plate to move apart and allowing the intermediate plate to move toward and away from the cover and base plates upon opening movement of the cover and base plates;
handle sections connected to the cover and base plates respectively and extending in a common direction away from the other end of the plates for imparting opening and closing movement to the plates; and
means for releasably latching the handle sections together.

4,181,074
ROTISSERIE AND BRAZIER
Arthur J. Hieb, 501 18th St., Rupert, Id. 83350
Filed Jul. 23, 1976, Ser. No. 699,220
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—421 HH **5 Claims**



1. A brazier comprising
a cabinet having sides, top and rear wall;
a base frame supporting said cabinet;
a trough-like firebox extending between said walls and having one side thereof adjacent said rear wall and supported by said frame;
a grease trough mounted adjacent the other side of said frame;
a rotisserie shaft supported by said frame and extending above said grease trough;
means interconnecting said rotisserie shaft and firebox and said frame for simultaneously adjusting the position of said firebox and said rotisserie shaft relative to each other; and
means for rotating said rotisserie shaft.

4,181,075
BUMPER-PRESS PRINTING DEVICE
Winston D. Williams, P.O. Box 22791, Tampa, Fla. 33622
Filed Apr. 7, 1978, Ser. No. 894,478
Int. Cl.[2] B41F *3/02, 3/20;* B41B *1/18, 11/40*
U.S. Cl. 101—269 **1 Claim**



1. A printing device comprising in combination:
a type holder with adjustable slots for holding individual type elements so as to form one or more lines of type, said holder including a frame member (**18**) having a base portion defined by an upper and lower surface with the lower surface forming a horizontal supporting face; opposite ends of said base portion each having an upstanding wall member, an inner vertical face of each said wall members being spaced apart and parallel relative to one another;
a horizontal upper surface of each said wall member having a spring clip member for holding opposite edges of a material to be printed;
a stationary space divider (**11**) affixed to said upper surface of said base portion and extending between and connected

to said inner vertical faces of said upstanding wall members, said space divider having a vertically extending face on each side thereof;

said base portion top surface and said vertical faces of said upstanding wall members forming a channel configuration on each side of said space divider (11);

a plurality of freely slidable space dividers (10, 12, 13, 14), at least one said slidable space divider being insertable into each said channel so as to form at least one adjustable slot defined by each said slidable space divider and the respective said vertical extending face of said stationary space divider (11) whereby each said slot may be adjusted to conform with a line of type insertable therein;

means extending through each said stationary and slidable space dividers for clamping the said slidable space dividers to said stationary space divider and to one another so that said space dividers are held together on said frame for thus securing said at least one line of type;

a hand roller for application of pressure for forcing the material to be printed against said line of type;

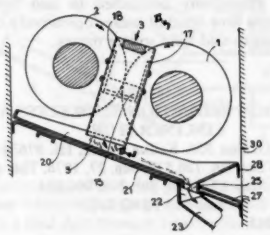
the outermost ones of said slidable space dividers each having a raised edge so as to form spaced raised edges with the said at least one line of type therebetween for thus preventing the said pressure roller from touching any part of the type holder beneath the level of the type faces or forcing the material to be printed against any part of the type holder beneath the level of the type faces.

4,181,076

INK RETURN CIRCUIT FOR A FLEXOGRAPHIC PRINTING MACHINE

Yves Gattus, Villeurbanne, France, assignor to S.A. Martin, Villeurbanne, France

Filed May 31, 1978, Ser. No. 911,142
Claims priority, application France, Jun. 3, 1977, 77 16948
Int. Cl.[2] B41F *31/02;* B41L *27/04*
U.S. Cl. 101—350 **2 Claims**



1. A device for use in the ink return circuit of a flexographic printing machine comprising means for feeding ink into the gutter formed by a stereo transfer roller and a pressure-regulating roller, excess ink overflowing at the ends of said rollers into said return circuit, said device comprising:

a set of interchangeable deflecting spouts;

means for removably mounting one of said spouts at each end of the inking rollers and between the journals thereof;

and means for holding each of said spouts under pressure against the respective end faces of said rollers,

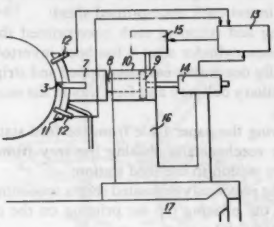
each of said spouts including three doctor blades comprising a central doctor blade extending substantially along the line of the centers of the rollers and inclined to form an overflow, and two lateral doctor blades extending at right angles to said central doctor blade and to the end face of the rollers.

4,181,077

PREPARATION OF PRINTING SURFACES

Brian L. Dalton, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Aug. 22, 1977, Ser. No. 826,747
Claims priority, application United Kingdom, Mar. 1, 1974, 9442/74
Int. Cl.[2] B41C *1/04;* B41N *3/02*
U.S. Cl. 101—401.1 **10 Claims**



1. A method of making a gravure cylinder, for use in a gravure printing process, comprising the steps of:

forming a cylinder having a surface of a first material with recesses in a regular pattern and all of substantially the same depth, the recesses constituting gravure cells separated by cell walls;

filling the recesses with a second material in liquid form and allowing the said second material to solidify, the solidified material being more easily removed than the first material by a scanning energy beam, the second material being used in excess of that required to fill the recesses; and

thereafter subjecting the surface of the filled cylinder to an abrading operation to remove a surface layer of the filled cylinder;

sensing the cylindrical surface of the first material formed by the tops of the cell walls at a point closely adjacent to the point from which removal of the surface layer is to take place; and

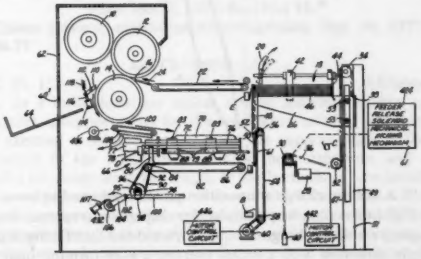
using, as a reference to control the thickness of the surface layer to be removed at any point said cylindrical surface of the first material formed by said tops of the cell walls.

4,181,078

AUTOMATIC RECIRCULATING DUPLICATOR

William A. Davis, Wickliffe, Ohio, assignor to AM International, Inc., Los Angeles, Calif.

Filed Dec. 8, 1977, Ser. No. 858,682
Int. Cl.[2] B41M *5/00;* B41L *21/06;* B41F *13/64*
U.S. Cl. 101—426 **7 Claims**



6. A method of duplex duplicating using a single head duplicator having a printing nip between a printing cylinder and an impression cylinder, a paper table for copy paper sheets which is capable of being placed in and withdrawn from a feed station, an external paper receiver at a primary delivery station, a

secondary delivery station, a controlled gripping and stripping apparatus and an auxiliary delivery and feed tray, which method comprises the steps of:

placing the paper table in the feed station with copy paper sheets thereon;

feeding copy paper sheets sequentially from the paper table to the printing nip to print on the first side of each sheet;

gripping each sheet against the impression cylinder after it has been printed on the first side;

rotating each once-printed sheet with the impression cylinder to invert each once-printed sheet;

ungripping and stripping each once-printed sheet from the impression cylinder after it has been inverted;

sequentially depositing each ungripped and stripped sheet in the auxiliary delivery and feed tray at the second delivery station;

withdrawing the paper table from the feed station;

thereafter mechanically shifting the tray from the second delivery station to the feed station;

feeding the previously deposited sheets sequentially from the tray to the printing nip for printing on the other side of each sheet; and

stripping each sheet from the impression cylinder and depositing it in the external paper receiver after it has been printed on the other side.

4,181,079

HOLLOW CHARGE AMMUNITION CONSTRUCTION

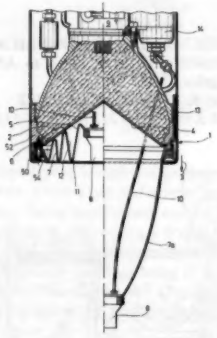
Hermann Klier, Waidhofen; Gerd Kellner, Aresing, and Johann Mayer, Rettenbach, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,958

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645419

Int. Cl.[2] F42B *13/10*

U.S. Cl. 102—56 SC **9 Claims**



1. A hollow charge ammunition which is adapted to move in a flight direction, in particular for dispersive weapons, comprising a hollow charge having a forward end face facing in the flight direction with a recess therein, a barb-forming liner in said recess overlying said end face, a folded member disposed in said recess extending across said end face and being unfoldable into an aerodynamically formed stable structure extending outwardly from said recess and means for unfolding said folded member.

4,181,080

SUPPORT STRUCTURE FOR A MAGNETICALLY LEVITATED VEHICLE

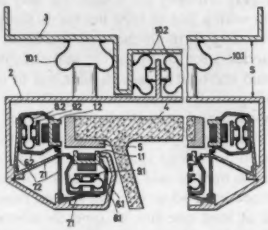
Luitpold Miller, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,003

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714282

Int. Cl.[2] B61B *13/08*

U.S. Cl. 104—148 MS **11 Claims**



1. An apparatus for supporting a magnetically levitated vehicle, comprising chassis means, a vehicle body, first spring means supporting said vehicle body relative to said chassis means, magnet means for providing magnetic forces, second spring means securing said magnet means to said chassis means, said first and second spring means comprising respective first and second fluid filled bellows means and means operatively connected to said first and second fluid filled bellows means for adjusting the fluid in said second bellows means in response to the fluid in said first bellows means, said adjusting means comprising valve means operatively interconnecting said first and second bellows means, and valve control means operatively connected to the respective valve means, said valve control means being responsive to spacing variations of the respective one of said magnet means relative to said chassis means whereby the fluid quantity or volume in said second bellows means may be increased out of the next respective one of said first bellows means, said apparatus further comprising fluid source means operatively connected to said first bellows means, and return flow conduit means operatively connecting said valve means to said fluid source means.

4,181,081

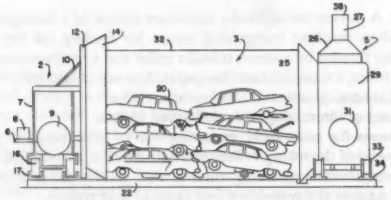
POLLUTION REDUCTION SMOKELESS AUTO INCINERATOR

Roy Weber, P.O. Box 336, Kailua, Oahu, Hi. 97634

Continuation of Ser. No. 726,529, Sep. 27, 1976. This application May 17, 1978, Ser. No. 906,814

Int. Cl.[2] F23G *5/12*

U.S. Cl. 110—212 **24 Claims**



1. A smokeless motor vehicle incinerator apparatus comprising vehicle confining means for receiving and holding motor vehicles to be incinerated, igniting means adjacent the vehicle confining means for inflaming vehicles held by the vehicle confining means, smoke guiding means adjacent the vehicle confining means for directing smoke generated by incineration

of vehicles held by the vehicle confining means to smoke control means, smoke control means ajacent the vehicle confining means for receiving smoke generated by incineration of vehicles held by the vehicle confining means converting substantially all of the received smoke to heat and expelling heat into the environment, the smoke control means comprising a smoke collecting chamber adjacent the vehicle confining means for receiving smoke from the vehicle confining means and communicating received smoke to smoke elimination means, smoke elimination means connected to the smoke collecting chamber for receiving smoke from the smoke collecting chamber comprising smoke heating means for heating received smoke, smoke combustion means for converting received smoke into heat through combustion, and expelling means for releasing the heat into the environment,

further comprising first moving means connected to the smoke control means and the ground to enable lateral movement of the smoke control means, second moving means connected to the ignition means, smoke guiding means and the ground to enable lateral movement of the ignition means and smoke guiding means, the first and second moving means longitudinally spaced and parallel, enclosing means connected to the smoke control means, the ignition means and the smoke guiding means for enclosing the longitudinal space between the first and second moving means, the vehicle confining means comprising the longitudinal space and the enclosing means.

4,181,082

SOLID FUEL FURNACE

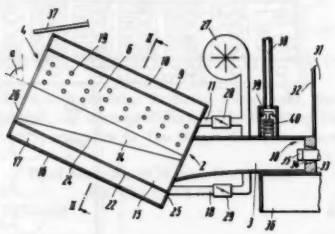
Hans Grossniklaus, Garage, 3855 Brienz, Switzerland

Filed Jun. 14, 1978, Ser. No. 915,168

Claims priority, application Switzerland, Jun. 17, 1977, 7454/77

Int. Cl.[2] **F23L** *1/02;* **F23K** *5/00*

U.S. Cl. 110—297 **8 Claims**



1. In a furnace installation for burning solid fuel a combustion chamber which is elongated and is inclined at an angle to the vertical, a feed duct through which solid fuel is adapted to be conveyed, said combustion chamber having one end face connected to said feed duct and having an opposite open end face, a primary air chamber connected beneath and a secondary air chamber connected above said combustion chamber, lower side-walls defining the lower part of the combustion chamber between the end faces forming a channel having a downwardly-tapered cross-section and defining the upper part of said primary air chamber, said lower side-walls being provided with openings for primary air from the underside of the combustion chamber, said primary air openings having a lateral dimension decreasing in the direction of the open end face of the combustion chamber, upper side-walls defining the upper part of the combustion chamber and defining the lower part of the secondary air chamber and being provided with second openings therethrough for secondary air, a source of air, and blast-air feed conduits connected from said source of air to the primary air chamber and the secondary air chamber.

4,181,083

MECHANISM FOR CONTROLLING THE WORKPIECE PRESSURE GRIPPERS OF BUTTONHOLE BAR TACKER SEWING MACHINES

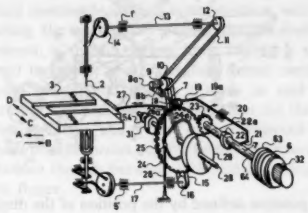
František Bajer; Josef Nejedlý, and Milos Kral, all of Prostejov, Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jan. 2, 1979, Ser. No. 435

Claims priority, application Czechoslovakia, Dec. 30, 1977, 9052-77

Int. Cl.[2] **D05B** *3/06, 69/20*

U.S. Cl. 112—67 **5 Claims**



1. In a buttonhole bar tacker sewing machine having a stitch forming mechanism including a needle, a cutting cam controlled by a device for selectively cutting the buttonhole either before or after bar tacking, a support plate for the workpiece, a device for exerting a motion of the support plate relative to the longitudinal axis of the needle in a shape corresponding to the required shape of bar tacking the buttonhole, pressing grippers which when lowered retain the workpiece in their gripping position on the support plate, and a device for stopping the machine upon completion of the buttonhole, all said devices operating automatically upon starting the machine, the improvement which comprises a first disengaging member coupled with mechanism for lifting the pressing grippers, a second disengaging member coupled with a device for selectively starting and stopping the machine, said two disengaging members being situated within the path of rotary motion of at least one section of at least one part mounted rotatably and coupled in its motion with the device for exerting a relative motion of the support plate of the workpiece relative to the longitudinal axis of the needle as well as with the cutting cam.

4,181,084

BUTTONHOLE BAR TACKER SEWING MACHINE WITH A DEVICE FOR CONTROLLING THE BUTTONHOLE LENGTH TERMINATED BY A WEDGE BAR TACK

František Bajer, and Josef Nejedlý, both of Prostejov, Czechoslovakia, assignors to Elitex, Koncern Textilniho Strojirenstvi, Liberec, Czechoslovakia

Filed Jan. 2, 1979, Ser. No. 11

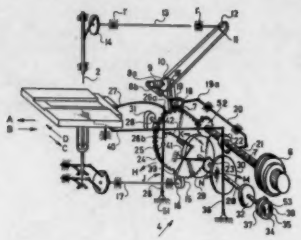
Claims priority, application Czechoslovakia, Dec. 30, 1977, 9050-77

Int. Cl.[2] **D05B** *3/06*

U.S. Cl. 112—71 **6 Claims**

1. In a buttonhole bar tacker sewing machine having an overarm, a support plate for the workpiece, control members for exerting a reverse motion upon the support plate in the direction of the longitudinal axis of the buttonhole, and a device for controlling the length of the buttonhole terminated by a wedge bar tack, the improvement which comprises a first cam for reciprocating the support plate in the direction of the longitudinal axis of the buttonhole, a second cam for forming a wedge bar tack, and at least one further, third cam coupled in its motion with the first cam, said further cam being arranged on the one hand reversibly and rotatably about its axis of rotation, and on the other hand adjustably in its angular position and adjustable relative to the first cam, the second cam being reversibly coupled in its motion with a reversible motion

of the support plate in the direction of the longitudinal axis of the buttonhole, the third cam being provided with a cam groove consisting of a section having a symmetrical course relative to the axis of rotation of the second cam for bar tacking the wedge bar tack of the buttonhole, and a further section consisting of two parts mutually offset as to their radial height, a roller mounted on a displaceable pin being inserted in said cam groove, said roller following, in dependence upon its



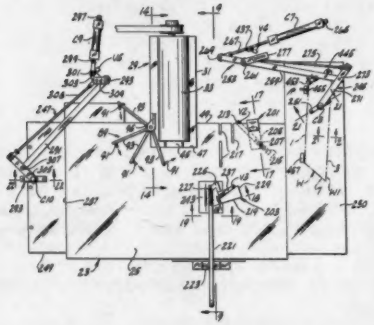
height position defined by the position of the displaceable pin, the path of either one or the other of the two parts mutually offset as to the height of the cam groove and following independently of its height position the path of the symmetrical section of the cam groove, each of the two height positions of the displaceable pin being defined by the angular position of the said further, third cam coupled in its motion with the first cam.

4,181,085

AUTOMATIC SEWING APPARATUS

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Mo.

Filed Aug. 15, 1977, Ser. No. 824,341
Int. Cl.[2] D05B *21/00, 27/06*
U.S. Cl. 112—121.12 **29 Claims**



1. Apparatus for automatically sewing workpieces along edges of each workpiece extending in different directions comprising:

a sewing machine having means for feeding a workpiece therethrough for being stitched and a needle for stitching a seam along an edge of the workpiece as it is fed through the sewing machine;

means for controlling the sewing machine operable to start it and operable to stop it with the needle down in a workpiece for utilization of the needle as a pivot for turning the workpiece;

means for guiding a workpiece through the sewing machine for stitching a seam along an edge of the workpiece;

means operable with the needle down in a workpiece for blowing air on the workpiece in such direction as to turn the workpiece by blowing it around the needle as a pivot;

means operable as a workpiece is being fed through the sewing machine and stitched along one edge thereof for sensing when the workpiece reaches a seam-ending position for terminating the stitching along said one edge;

means controlled by said sensing means operable when said sensing means senses the workpiece reaching said seam-ending position for operating said sewing machine control means to stop the sewing machine with the workpiece in said seam-ending position and with the needle down in the workpiece, and then operating the blowing means to blow air on the workpiece for blowing it around;

stop means engageable by an edge of the workpiece as the workpiece is being blown around to stop the workpiece in a seam-starting position for stitching a seam along the next edge; and

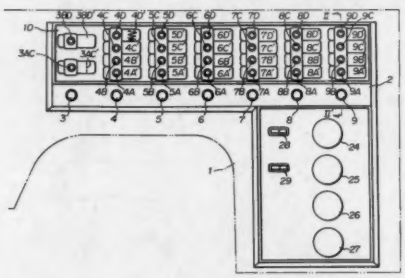
means operable by the workpiece as it reaches said seam-starting position for controlling said sewing machine control means to start the sewing machine for stitching along said next edge.

4,181,086

PATTERN SELECTING SYSTEM FOR SEWING MACHINE

Hideaki Takenoya; Kazuo Watanabe, both of Hachioji; Toshiaki Kume, Tachikawa; Hachiro Makabe, Fussa, and Tamotsu Nakagawa, Hachioji, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,911
Claims priority, application Japan, Mar. 18, 1977, 52-29315
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 F **10 Claims**



1. In a sewing machine having a machine housing, a memory storing data for a plurality of selectable stitch patterns and pattern forming devices actuated by the stitch-pattern data, a novel user-operated pattern-selection system comprising, in combination, a plurality of similarly organized groups of pattern indicator elements located on the exterior of the machine housing, each pattern indicator element having an indicating and a non-indicating state, a plurality of user-activated selector switches, one for each of said similarly organized groups of pattern indicator elements, and control circuit means connected to the useractivated selector switches and connected to the pattern indicator elements, the control circuit means being operative, when the user activates a selector switch not associated with the group containing the presently indicating indicator element, for causing the presently indicating indicator element to convert to non-indicating state and furthermore causing a predetermined one of the indicator elements in the group associated with the newly activated selector switch to assume indicating state.

4,181,087

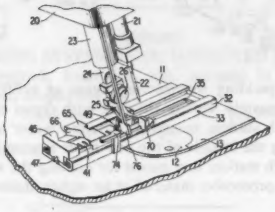
METHOD FOR INITIALLY POSITIONING A TRAVELING BUTTONHOLE PRESSER FOOT

Robert B. Brauch, Wayne, and Russell Pepe, Piscataway, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,013

Int. Cl.[2] D05B *3/06*

U.S. Cl. 112—264.1 **3 Claims**



1. A method for initiating stitching of a one step buttonhole in a piece of material by a zig zag sewing machine having a zig zag stitching mechanism, a reversible work feeding mechanism, intelligence retaining means for retaining a record of a buttonhole stitch position coordinates for production of a first segment of a buttonhole end and side bar followed by production of a second segment of an opposite end and side bar, and a presser foot having a sliding portion thereof biased to an initiating position and movable with a work material during formation of a buttonhole, said presser foot including means operatively connected to said intelligence retaining means for initiating release of intelligence from said intelligence retaining means for production of said second segment of said buttonhole; the method comprising the step of:

operating said sewing machine for at least one stitch cycle with said reversible feeding mechanisms set to feed in a direction to urge said sliding portion of said presser foot to said initiating position.

4,181,088

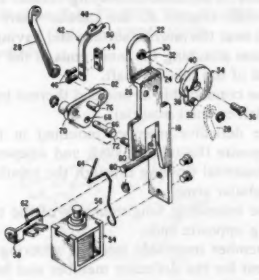
UNDERBED THREAD TRIMMER FOR SEWING MACHINES

Rolf E. Kessler, Karlsruhe; Reinhold Papajewski, Stutensee-Friedrichthal, and Dietmar Polixa, Karlsruhe, all of Fed. Rep. of Germany, assignors to The Singer Company, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,587

Int. Cl.[2] D05B *65/00*

U.S. Cl. 112—292 **4 Claims**



1. An underbed thread trimmer for a sewing machine having a rotating loop taker driven by a drive shaft for concatenating a needle thread with a bobbin thread from a bobbin contained within said loop taker, said thread trimmer comprising a thread handling member having a first face and a second face, mounting means for pivotally mounting said thread handling member in spaced relation to said loop taker, a thread catcher extending away from said first face of said thread handling member and toward said loop taker, means defining a thread cutting finger on the periphery of said second face of said thread handling member, said thread cutting finger forming a notch with the intersection of said second face of said thread handling member for operably restraining needle and bobbin threads guided to said thread cutting finger by said thread catcher, drive means for selectively pivoting said thread handling member from an initial position on one side of the stitching location in a first direction about said mounting means to a second position on the other side of the stitching location and for pivoting said thread handling member back to its initial position, said thread catcher catching the needle and bobbin threads during the return movement, a thread cutting knife having a notched finger disposed for cooperation with said thread catcher for restraining said needle and bobbin threads as said thread catcher returns to its initial position and guides the threads to the thread cutting finger, and a knife surface disposed in relation to the path of said thread cutting finger for severing said needle and bobbin threads between said thread cutting finger and said knife finger.

4,181,089

CASETTE TAPE TAKE-UP INDICATOR

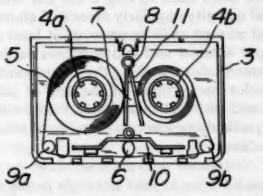
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,719

Claims priority, application Japan, Jan. 21, 1977, 52/6223; Jan. 21, 1977, 52/6574[U]

Int. Cl.[2] G01D *13/00;* **G11B** *27/34*

U.S. Cl. 116—278 **6 Claims**



1. A tape cassette for a tape recorder comprising: a cassette housing; a pair of hubs rotatably mounted within said housing; a predetermined length of magnetic tape extending about both said hubs adapted to be reversibly wound therebetween; display window means in said housing; and indicator means positioned within said housing to be viewed through said display window means and arranged to clearly and visibly provide an indication of the position of said tape on said hubs; said indicator means comprising an easily observed indicator member having a V-shaped configuration including an apex portion and a pair of legs extending therefrom; and support means within said housing having said apex portion of said indicator member mounted thereon and pivotally securing said indicator member within said housing in a position to be viewed through said display window means; said V-shaped display member extending between said hubs with each of said legs arranged to extend from said apex portion with a spacing therebetween such that said legs are retained slidably engaged, respectively, against portions of said tape wound on one of said hubs, said display member having a widening resiliency provided between said hubs to maintain each of said legs in contact with said tape with a slight spring force.

4,181,090

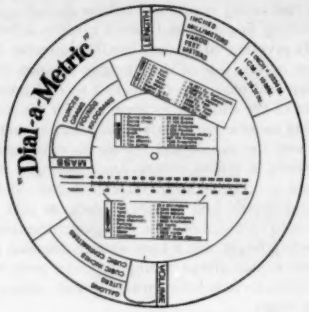
DIAL-A-METRIC

Carl M. Calise, 903 E. 19 St., Brooklyn, N.Y. 11230

Filed Aug. 23, 1978, Ser. No. 925,922

Int. Cl.[2] G06C *17/00*

U.S. Cl. 116—309 **1 Claim**



1. A system of units conversion device which includes:

three coaxial circular discs, two outside discs and an inside disc, mounted for relative rotation about their common axis;

the inside disc having sets of contiguous juxtapose circular scales arranged at least one radius with numerical indicia linearly related to their angular displacement about the common axis of said discs, such scales being on both faces of said inside disc and each set having a different identifying color background,

each scale having the value of said numerical indicia also linearly related to a physical quantity, as described by a system of units;

the scales of each set being for the same physical quantity;

the outside discs each having a die cut window for each physcial quantity angularly separated about said common axis and at such radii to uncover at least one set of said scales per window and said windows having indicia with background color matching the corresponding said identifying color background of the sets of scales to clearly match said physical quantities of said windows to said scales, particularly where a plurality of windows have the same radius;

a hairline contiguous with each window;

wherein each set has at least one scale in one system of units and at least one other scale in another system of units whereby the conversion from said one system of units to the other system of units is facilitated.

4,181,091

APPARATUS FOR PICKLING CAST ROD

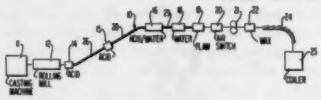
Daniel B. Cofer; Enrique C. Chia; John E. Burnitte, and Theodor W. Kaltenberg, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 540,022, Jan. 10, 1975, Pat. No. 4,005,744, which is a division of Ser. No. 446,842, Feb. 28, 1974, abandoned, which is a division of Ser. No. 109,421, Jan. 25, 1971, Pat. No. 3,806,366, which is a division of Ser. No. 808,976, Mar. 20, 1969, Pat. No. 3,623,532. This application Oct. 3, 1975, Ser. No. 619,273

Int. Cl.[2] C23G *1/02*; B05C *15/00, 5/00*

U.S. Cl. 118—63 **5 Claims**

1. Apparatus for treating metal rod or the like comprising means for passing rod along its length through a predetermined path, means for wiping the rod with a flow of high velocity fluid at a first station, means for pickling the rod including means for impinging the rod with a flow of high velocity pickling sequestering agent at a second station, means for flowing pickling sequestering agent in contact with and along the length of the rod in the direction opposite to the movement of the rod from a third station toward the second station, means for flowing pickling sequestering agent in contact with and along the length of the rod from a fourth station toward the third station, means for impinging the rod with a flow of



high velocity pickling sequestering agent at a fifth station, means for alternately wiping the rod with flows of air and water at a sixth station, means for flowing water in contact with and along the length of the rod from a seventh station toward the sixth station, and means for coating the surface of the rod with a protective material at an eighth station.

4,181,092

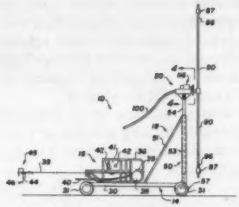
MACHINE FOR TREATING PIPE INTERIORS

Charles Johnson, 5575 Grant St., North Burnaby, British Columbia, Canada (V5B 2K2)

Filed Feb. 10, 1978, Ser. No. 876,683

Int. Cl.[2] B05C *7/02*; B24C *3/32*

U.S. Cl. 118—72 **4 Claims**



1. A machine for providing first and second treatments to the interior surface of a length of pipe and comprising:

a carriage movable longitudinally through said pipe,

a support structure mounted on the carriage,

a tubular shaft having opposite ends,

mounting means securing the tubular shaft to the support structure for rotation about the longitudinal axis of said shaft and with said axis substantially aligned with the corresponding axis of the pipe,

a first plurality of material-conveying tubular arms radially disposed with respect to the tubular shaft and having outer ends near the interior surface and having inner ends,

securing means attaching the inner ends of the tubular arms to one end of the tubular shaft,

a supply hose connectable at one end thereof to a source of pressure-driven fluid material,

a removable deflector member mounted in the securing means opposite the tubular shaft and adapted to deflect the fluid material flowing through the tubular shaft into the first tubular arms,

an inner tube extending longitudinally of the tubular shaft and having opposite ends,

a support member insertable into the securing means as a replacement for the deflector member and having a central opening through which a portion of the inner tube projects,

a second plurality of material-conveying tubular arms radially disposed with respect to the inner tube and having outer ends near the interior surface and inner ends,

a fitting securing the inner ends of the second plurality of

material-conveying tubular arms to a projecting end of the inner tube,

coupling means non-rotatably securing an opposite end of the supply hose to the mounting means in communication with one of the tubular shaft and the inner tube, and

drive means on the support structure for rotating the tubular shaft and the tubular arms whereby the fluid material discharging from the outer ends is applied to the interior surface as the carriage moves through the pipe.

4,181,093

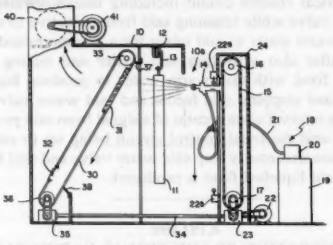
SPRAYING SYSTEM WITH IMPROVED EXHAUST

Gilman Tredwell, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Apr. 6, 1978, Ser. No. 893,998

Int. Cl.[2] B05C *15/00*

U.S. Cl. 118—323 **7 Claims**



1. A spraying system for applying a coating to a plurality of articles comprising a booth having a movable back surface, a movable spray gun, a source of coating material to be sprayed, means for carrying a plurality of articles to be coated through the booth and between the spray gun and the movable back surface, the spray from said spray gun being directed at the articles and the moveable back surface during spraying operations and as the spray gun is moved, the movable back surface having a vent opening, a fan to exhaust atmosphere from the spray booth through said vent opening, and means for moving the movable back surface and gun in synchronism to maintain the vent opening directly before the spray gun during spraying operations.

4,181,094

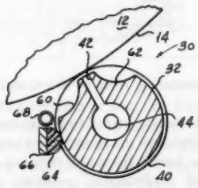
EXCESS DEVELOPER REMOVAL APPARATUS

Kenneth W. Gardiner, Menlo Park, Calif., assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 766,068, Feb. 7, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,199

Int. Cl.[2] G03G *15/00*

U.S. Cl. 118—652 **26 Claims**



1. Apparatus for removing excess developer liquid from a moving image-bearing surface carrying a layer of liquid developer of a certain thickness including, in combination:

an elongated barrier member;

means for mounting said barrier member with the length thereof extending across the portion of said surface bearing said image, with a substantially unpressurized region immediately in advance of the leading portion of said barrier member and adjacent to said developer layer, and with a spacing between the leading portion of said barrier member and said surface which is less than the thickness of said developer layer to intercept said layer; and

means for forming an air curtain behind the leading portion of said barrier member in the region of adjacency of said member and said surface.

4,181,095

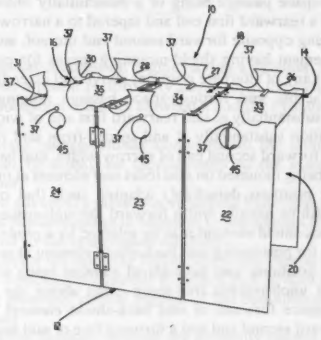
SCREEN ASSEMBLY FOR ANIMAL LITTER STATION

Michael Sylogye, 429 Roscoe, Chicago, Ill. 60657

Filed Jan. 18, 1978, Ser. No. 870,252

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—1 **10 Claims**



1. A collapsible screen assembly for encircling and enclosing an animal litter station, comprising in combination,

a screen assembly formed by opposed sidewalls, a backwall and having an open front portion,

each of said opposed sidewalls being formed by a plurality of sidewall panels,

each of said sidewall panels being reversely hinge-mounted to the next adjacent wall panel,

said backwall being formed by a back wall panel having one of each of said plurality of opposed sidewall panels hingedly secured thereto,

said hinged securement permitting each of said opposed sidewall panels to travel only interiorally with respect to said backwall panel,

and a top wall removably engaged to said opposed sidewall panels and said backwall panel by engagement means such that said top wall is removably engaged with each of said plurality of opposed sidewall panels and with said back wall panel thereby to provide rigidity and stability of said screen assembly when in use,

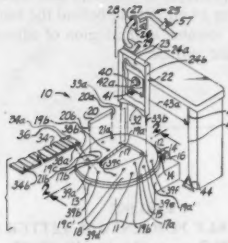
whereby said screen assembly may be unfolded to provide a substantially total enclosure for an animal litter station while still permitting access thereto by the animal through said open front portion, and allowing said screen assembly to be completely folded into a compact storage posture by reverse folding of said opposed sidewall panels one with respect to the next adjacent panel, and interiorally folding said stack of opposed sidewall panels with respect to said back wall panel.

4,181,096

PET AND BABY TOILET SEAT

Moe M. Grubman, 99-32-66 Rd., Rego Park, N.Y. 11374

Filed Mar. 16, 1978, Ser. No. 887,001
Int. Cl.[2] A01K *1/035*; E03D *11/02*
U.S. Cl. 119—1 **11 Claims**



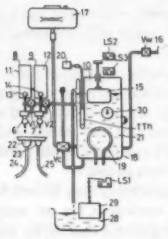
1. A toilet seat device comprising in combination: a toilet seat element having a planar upper surface with a through-space passage therethrough substantially centrally thereof, the through-space passage being of a substantially oblong shape wider at a rearward first end and tapered to a narrow width at a remaining opposite forward second end thereof, and a back-shield element having shield-mounting means for positioning erectly at any of alternate positions above and extending transversely across said through-space passage ranging from a position substantially at said rearward first end of wider width to a position substantially at and spaced-from said remaining opposite forward second end of narrow width, said back-shield element being mounted on said toilet seat element at one of said alternate positions detachably adapted such that optionally wide width or narrow width forward through-space forward of the back-shield element may be selected by a predetermined selection for positioning said back-shield element at said any of alternate positions, said back-shield element being structured such that unobstructed free-space exists above the forward through-space forward of said back-shield element between said forward second end and a forward face of said back-shield element.

4,181,097

AUTOMATIC FEEDING DEVICES FOR DOMESTIC ANIMALS

Ikuo Betsuno, Okazaki, Japan, assignor to Chubu Shiryo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 2, 1977, Ser. No. 856,775
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51.11 **1 Claim**



1. An automatic feeding device for domestic animals comprising:

a canister containing powder for preparing liquefied food;

a feeder connected to said canister;

a water tank containing warm water for preparing said liquefied food while keeping said warm water at a certain temperature;

a water valve connected to said water tank for a controlled discharge of water therefrom;

a mixer connected to said feeder and said water valve to receive and mix said powder and said warm water therein to give said liquefied food;

a pipe connecting said mixer to said water valve, said pipe being of a length whereby warm water remaining therein, after stoppage of said water valve, is sufficient to rinse said mixer for a certain period;

a mixing bowl for receiving warm water or liquefied food flowing from said mixer;

a hose extending from said mixing bowl for supplying warm water or liquefied food from said mixing bowl to feeding plates in animal cages;

a 24-hour program timer for optionally setting feeding time; and

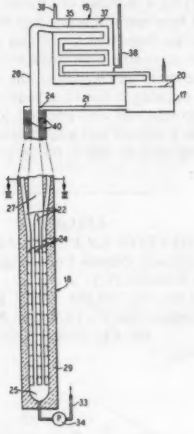
an electrical control circuit including means opening said water valve while retaining said feeder inactive to supply only warm water to said mixer for a predetermined time, thereafter also activating said feeder and mixing powdered food with said warm water to produce liquefied food, and stopping said feeder and said water valve at a certain interval upon receipt of a signal from said program timer, said electrical control circuit being set to substantially simultaneously stop said water valve and said feeder after said liquefied food is produced.

4,181,098

HEAT GENERATION BY FRICTIONAL VAPORIZATION

Clifford L. Kruse, 326 S. Myrtle, Villa Park, Ill. 60181

Filed Mar. 30, 1978, Ser. No. 891,532
Int. Cl.[2] F22B *3/06*
U.S. Cl. 122—26 **22 Claims**



1. A method of generating heat by frictional vaporization, comprising:

introducing liquid to be vaporized into one end of a substantially vertically disposed elongate vaporizing passage;

causing the liquid to transit from said one end of the passage under substantial hydrostatic pressure and velocity toward the opposite end of the passage;

subjecting the transiting liquid to progressive vaporizing friction of a magnitude to heat and vaporize the liquid as the liquid moves at said pressure and velocity along the passage;

and receiving the hot vapor from said opposite end of said passage.

11. Apparatus for heat generation by frictional vaporization, comprising:

means defining a substantially vertically disposed elongate vaporizing passage having length to cross sectional flow ratio adapted for frictional vaporization of liquid forced therethrough under adequate hydrostatic pressure and velocity;

means for supplying liquid to be vaporized under said hydrostatic pressure and velocity into one end of said passage and for maintaining the liquid under said pressure and velocity in transit toward the opposite end of said passage;

friction means along the length of said passage operating to subject said liquid in transit under said hydrostatic pressure and velocity through said passage to friction of a magnitude to heat and vaporize the liquid by the time it reaches said opposite end of said passage;

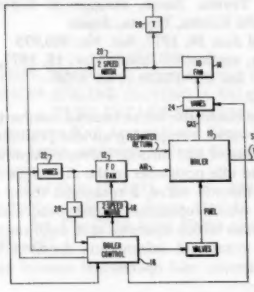
and means for receiving hot vapor from said opposite end of said passage.

4,181,099

COORDINATED CONTROL FOR POWER PLANT FORCED AND INDUCED DRAFT FANS DURING STARTUP AND FAN SPEED CHANGES

Morton H. Binstock, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 894,074
Int. Cl.[2] F22B *37/42*; F22D *5/00*
U.S. Cl. 122—448 R **15 Claims**



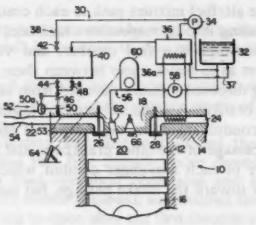
1. A system for operating at least one forced draft fan and/or at least one induced draft fan in a power plant boiler wherein an electric motor is provided to drive each fan, said system comprising speed switching means for operating each motor at least at a low speed and at a high speed, means for controlling the position of inlet vanes associated with each fan to control the boiler air flow and pressure in response to plant load demand, means for sensing inlet vane position, and sequential logic control means for operating said speed switching means to provide orderly and smooth changes in fan speed in response to said inlet vane position sensing means at predetermined vane positions.

4,181,100

INTERNAL COMBUSTION ENGINE OPERATED ON INJECTED FUEL SUPPLEMENTED WITH HYDROGEN

Kimitaka Yamane, Sayama; Akira Morita, Tokyo, and Zene Ueno, Fuchu, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 641,759, Dec. 17, 1975, Pat. No. 4,079,703.
This application Sep. 2, 1977, Ser. No. 830,192
Claims priority, application Japan, Dec. 18, 1974, 49-145190
The portion of the term of this patent subsequent to Mar. 12, 1995, has been disclaimed.
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 ST **3 Claims**



1. An internal combustion engine having a cylinder, a cylinder head and a piston reciprocally disposed in the cylinder to define a combustion chamber between it and the cylinder head, comprising:

an air-intake passage fluidly connected to the combustion chamber to supply air therethrough to the combustion chamber;

hydrogen gas supply means for supplying hydrogen gas into said air-intake passage in response to the amount of the air supplied to the combustion chamber;

a fuel injector for injecting liquid fuel to the central portion of the combustion chamber to form a rich air-fuel mixture at the generally central portion of the combustion chamber; and

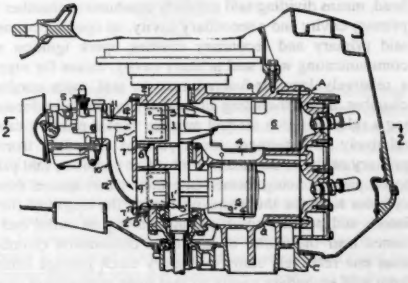
a spark plug disposed through the generally central portion of the cylinder head to ignite the rich air-fuel mixture at the generally central portion of the combustion chamber.

4,181,101

TWO-CYCLE INTERNAL COMBUSTION ENGINES WITH SCAVENGER MEANS

Yasuo Yamamoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 12, 1977, Ser. No. 841,521
Claims priority, application Japan, Oct. 13, 1976, 51-138060
Int. Cl.[2] F02B *33/28*
U.S. Cl. 123—73 A **4 Claims**



1. In a two-cycle, two-cylinder internal combustion engine

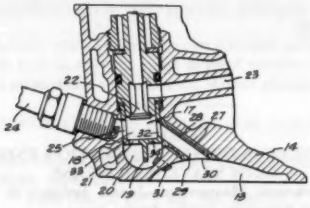
having a pair of crankcases, a pair of horizontal cylinders, one in each crankcase, one cylinder being disposed vertically above the other, a rotary, vertically-extending crankshaft in said crankcases rotated as the consequence of reciprocating movement of a piston in each of said cylinders, a carburetor for supplying air/fuel mixture to the crankcases through distributor passages, and an intake passage for each cylinder interconnecting the inside of the respective crankcase to the respective cylinder for valved supply of air/fuel mixture to said respective cylinder, the improvement comprising: a fuel catcher in the form of a horizontal depression inside each crankcase at the bottom thereof, disposed radially outwardly from the rotating portion of the crankshaft in the respective crankcase, a reed valve in the air/fuel mixture path to each crankcase, said reed valve extending into its respective crankcase, vertically overhanging the respective fuel catcher, and vertically spaced therefrom so as to leave a gap between them, each said reed valve being disposed radially outward from said rotating portions of the crankshaft in the respective crankcase, a respective scavenger conduit from the fuel catcher of each crankcase to the intake passage of the other crankcase, and a unidirectional check valve in each scavenger conduit which check valves permit flow toward the intake passage, but not the reverse.

4,181,102

DIVIDED AUXILIARY COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Shizuo Yagi, Asaka; Hiroshi Kogure, Tokorozawa, and Saburo Matsuoka, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,515
Int. Cl.[2] F02B *19/18, 75/02*
U.S. Cl. 123—75 B **3 Claims**



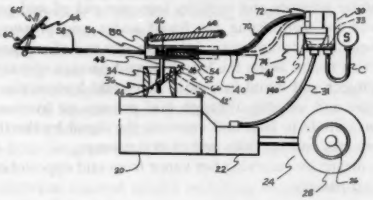
1. In an internal combustion piston engine, the combination of: a cylinder head, a main combustion chamber, means forming an auxiliary combustion chamber within said cylinder head, means dividing said auxiliary combustion chamber into a primary cavity and a secondary cavity, an opening connecting said primary and secondary cavities, spark ignition means communicating with said primary cavity, means for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake valve for supplying a relatively rich air-fuel mixture to said primary cavity, a relatively long primary torch passage extending from said primary cavity to said main combustion chamber, said primary torch passage being formed in a liner insert spaced from the cylinder head for the major portion of the length of the liner insert, said primary torch passage having an outlet end positioned near the center of said main combustion chamber, at least one relatively short secondary torch passage extending from said secondary cavity to said main combustion chamber and having an outlet end positioned adjacent a peripheral zone of said main combustion chamber.

4,181,103

GOVERNOR FOR ENGINE AND LOAD SPEEDS

Harry D. Sturdy, Wilmington, N.C., assignor to Sturdy Truck Equipment, Inc., Wilmington, N.C.

Filed May 6, 1977, Ser. No. 794,615
Int. Cl.[2] F02D *1/04, 1/08, 31/00, 33/00*
U.S. Cl. 123—102 **14 Claims**



1. An engine and load speed governor for an engine and load connected by a multi-ratio transmission and having a throttle and a driver-operated throttle linkage for controlling the energy supply of the engine comprising:

(a) an overriding throttle-closing linkage;

(b) means for selectively operating said overriding linkage in throttle-closing and throttle-opening directions at predetermined rates;

(c) high engine speed responsive means for independently causing said operating means to operate in said closing direction;

(d) high load speed responsive means for independently causing said operating means to operate in said closing direction; and

(e) low engine speed responsive means and low load speed responsive means for jointly causing said operating means to operate said overriding linkage in said throttle-opening direction when concurrently responsive.

4,181,104

IDLE SPEED CONTROLLER FOR INTERNAL COMBUSTION ENGINES

Kazuo Shinoda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

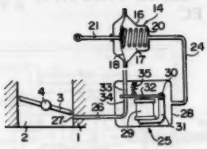
Filed Jun. 28, 1977, Ser. No. 810,873
Claims priority, application Japan, Mar. 15, 1977, 52-28500
Int. Cl.[2] F02M *1/00, 3/08*
U.S. Cl. 123—102 **3 Claims**

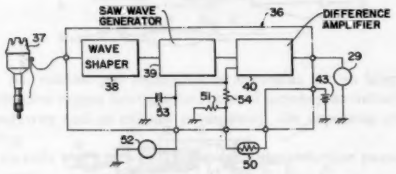
1. An idle speed controller for an internal combustion engine having a throttle valve, comprising an idle positioner for setting the idle position of said throttle valve, a diaphragm actuator for biasing said idle positioner in the directions of opening and closing said throttle valve, a rotational speed sensor for detecting a signal which represents engine speed, and an operational control means which operates said diaphragm actuator depending upon rotational information received from said rotational speed sensor, said operational control means comprising:

an intake vacuum take-out port;

a vacuum modulator, which modulates intake vacuum taken from said port and supplies a modulated vacuum to said diaphragm actuator, comprising a housing, a solenoid mounted in said housing, an armature-flapper valve adapted to be actuated by said solenoid, a first nozzle adapted to be controlled by said flapper valve to selectively communicate the internal space of said housing to the atmosphere, a second nozzle adapted to be controlled by said flapper valve to selectively communicate the internal space of said housing to said manifold vacuum take-out port, and a conduit means which communicates the internal space of said housing to said diaphragm actuator;

and an electric control circuit for controlling said vacuum modulator in accordance with said rotational speed information, which generates an electric pulse ouput for engergizing said solenoid, and which comprises a wave-shaping circuit which processes said rotational speed information to generate a trigger signal having frequency proportional to the rotational speed of the engine, a saw-wave generator for generating saw-waves each being triggered by said trigger signal, a comparison voltage generating circuit for generating a comparison voltage, a pressure switch for





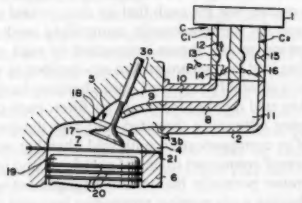
detecting intake vacuum incorporated in said comparison voltage generating circuit so as to substantially lower said comparison voltage when intake vacuum has increased beyond a predetermined value, and a difference amplifier which compares said saw-waves and said comparison voltage and generates said pulse output having a duty ratio which is the ratio of a first duration wherein said saw-wave is higher than said comparison voltage to a second duration wherein said saw-wave is lower than said comparison voltage.

4,181,105

IGNITION TIMING CONTROL FOR INTERNAL COMBUSTION ENGINE HAVING A DUAL INDUCTION TYPE INTAKE SYSTEM

Yasunori Takemoto; Koji Asanomi, and Kazuo Kobayashi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 12, 1977, Ser. No. 859,758
Claims priority, application Japan, Dec. 13, 1976, 51-150095
Int. Cl.[2] F02P *5/04*; F02M *13/06*
U.S. Cl. 123—117 A **4 Claims**



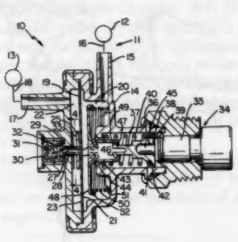
1. Internal combustion engine comprising:
cylinder head means,
cylinder means,
piston means disposed in said cylinder means for defining combustion chamber means with said cylinder head means,
carburetor means,
intake manifold means provided between said carburetor means and said cylinder head means,
intake port means provided in said cylinder head means opening to said combustion chamber means,
first and second intake passage means provided in said carburetor means, said intake manifold means, and said cylinder head means and separated by wall means, said intake passage means being connected with said intake port means,
said first intake passage means having a cross-sectional area which is small in relation to that of said second intake passage,
first and second throttle valve means respectively provided in said first and second intake passage means of said carburetor means,
means for actuating said first and second throttle valve means so that said first throttle valve means is opened under light load operation conditions and said second throttle valve means is closed, said second throttle valve means starting to open after the first throttle valve means has been substantially fully opened,
means for controlling ignition timing,
means for sensing that the second throttle valve means has been started to open and for controlling said ignition timing control means so that ignition timing is advanced under operation wherein the second throttle valve means is opened,
said sensing means including pressure switch means which is adapted to be actuated under the pressure in said second intake passage.

4,181,106

ENGINE CONTROL SYSTEM AND A DIFFERENTIAL VACUUM REGULATOR THEREFOR OR THE LIKE

Harold G. Brakebill, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 672,593, Apr. 1, 1976, Pat. No. 4,108,372.
This application Jun. 12, 1978, Ser. No. 914,201
Int. Cl.[2] F02P *5/04*; G05D *23/00*
U.S. Cl. 123—117 A **5 Claims**



1. In a vehicle engine system having a vacuum manifold and a vacuum operated spark timing distributor, the improvement comprising a differential vacuum regulator having a housing means provided with an inlet interconnected to said vacuum manifold and an outlet interconnected to said distributor, and valve means carried by said housing means for interconnecting said inlet and said outlet together to produce a certain vacuum level at said outlet when said regulator is sensing an engine coolant temperature below a certain temperature whereby said distributor is operated at one level of operation thereof and for interconnecting said inlet and said outlet together to produce a different vacuum level at said outlet when said regulator is sensing said certain temperature whereby said distributor is operated at another level of operation thereof, said valve

means comprising a temperature sensing device and a flexible diaphragm that is responsive to the vacuum at said inlet, said diaphragm having an inlet side that is exposed to said inlet and having an outlet side that is exposed to said outlet, said valve means comprising a biasing means for acting on said inlet side of said flexible diaphragm and being controlled by said temperature sensing device, said temperature sensing device rendering said biasing means inactive by holding said biasing means away from said inlet side of said diaphragm when said temperature sensing device is sensing a temperature below said certain temperature and rendering said biasing means active by causing said biasing means to engage and act on said inlet side of said diaphragm when said temperature sensing device is sensing said certain temperature, said flexible diaphragm separating said inlet from said outlet and having opening means therethrough for interconnecting said inlet to said outlet, said valve means comprising a valve member for opening and closing said opening means, said housing means having a valve seat leading from said outlet to the atmosphere, another valve member for opening and closing said valve seat, the first-named valve member being operatively associated with said other valve member to open said other valve member when said first-named valve member has closed said opening means of said diaphragm and to close said other valve member when said first named valve member has opened said opening means of said diaphragm.

4,181,107

CARBURETOR CHOKE VALVE CONTROLLING DEVICE

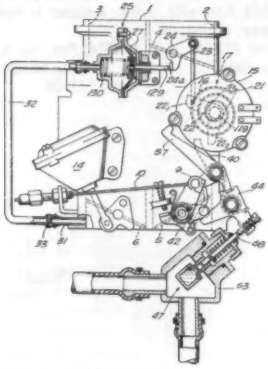
Toshio Nomura, Niiza, and Toshimasa Shishido, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 640,795, Dec. 15, 1975, abandoned, which is a continuation of Ser. No. 503,982, Sep. 6, 1974, abandoned. This application Jan. 23, 1978, Ser. No. 871,645

Claims priority, application Japan, Sep. 7, 1973, 48-100282

Int. Cl.[2] F02M *1/12*

U.S. Cl. 123—119 F **2 Claims**



1. A controlling device for a carburetor choke valve for an internal combustion engine, comprising in combination: a choke valve, a bimetal element sensing the engine ambient temperature, electrical resistance means for heating said bimetal element when said engine is in operation, the bimetal element having one end connected to operate the choke valve, means connected with the other end of the bimetal element for holding said other end at a first position when the engine is in the state of complete firing, and at a second position when the engine is stationary, said bimetal element acting to move said choke valve to choke pulldown angle in proportion to the engine ambient temperature and then opening it from said choke valve pulldown angle in response to the rise in the engine ambient temperature when said other end of the bimetal element is held at said first position.

4,181,108

SYSTEM FOR THE CONTROL OF THE COMPOSITION OF THE FUEL-AIR MIXTURE OF AN INTERNAL COMBUSTION ENGINE

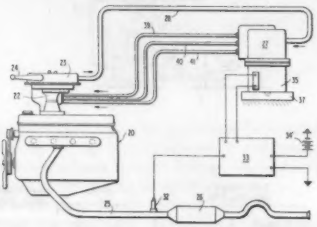
Francesco Bellicardi, Bologna, Italy, assignor to Edoardo Weber Fabbrica Italiana Carburatori S.p.A., Bologna, Italy

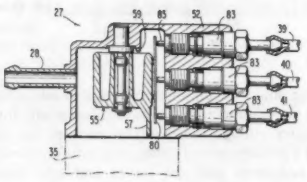
Filed Feb. 6, 1978, Ser. No. 875,710

Claims priority, application Italy, Feb. 7, 1977, 3343 A/77

Int. Cl.[2] F02M *11/00*

U.S. Cl. 123—119 EC **1 Claim**





1. A system for correcting the fuel-air ratio of the mixture delivered by a carburetor to an internal combustion engine comprising support means, an internal combustion engine mounted on said means, carburetor means on said engine having at least one main fuel-air duct and at least one idle fuel-air duct for supplying a fuel-air mixture to said engine, air filter means for supplying clean air to said carburetor, an exhaust system connected to said engine for the gases produced by said engine including probe means for sensing and providing a signal indicative of the oxygen concentration in said gases, an air metering device mounted on said support means separate from said engine, flexible conduit means supplying air from said air filter means to said device and from said device to said ducts and circuit means responsive to said signal from said probe means for controlling said metering device to correct the fuel-air mixture in response to oxygen concentration in the exhaust gases, said metering device including a plurality of air metering valve means, one for each fuel-air duct in said carburetor, cam means for simultaneously controlling said valve means and stepping motor means connected to said circuit means for rotating said cam means and an air chamber in which said cam means is rotatably mounted, said chamber having an inlet connected to said conduit from said air filter, each of said valve means being adjustably threaded into said device with one end thereof in communication with said chamber and the opposite end thereof connected to one of said ducts and including a valve member normally biased into engagement with a valve seat and having a pin portion protruding into said chamber, said cam means including a rotatable substantially cylindrical cam having a spiral external surface disposed substantially perpendicular to each pin and resilient plate means normally biased into engagement with said cam surface and opera-

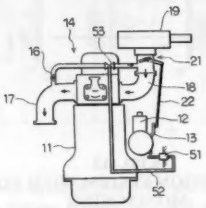
tively engaging each pin so that upon rotation of said cam means said valve members will be simultaneously moved relative to their respective seats to vary the air passing through said valve means.

4,181,109

EXHAUST GAS RECIRCULATION APPARATUS

Junichi Wake, Yono, and Hiroshi Matsuda, Sakado, both of Japan, assignors to Nissan Diesel Kogyo Company, Ltd., Ageo, Japan

Filed May 15, 1978, Ser. No. 906,012
Claims priority, application Japan, May 16, 1977, 52-56181
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **14 Claims**



1. An exhaust gas recirculation apparatus for an internal combustion engine having a fuel control member, an induction passageway and an exhaust passageway, the apparatus comprising:

a throttle valve movably disposed in the induction passageway;

a recirculation passageway leading from the exhaust passageway to the induction passageway downstream of the throttle valve;

stopper means for limiting movement of the throttle valve in a closing direction; and

linkage means connecting the fuel control member to the throttle valve in such a manner that movement of the fuel control member in a fuel increasing direction beyond a predetermined position causes the throttle valve to move in an opening direction.

4,181,110

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tokio Kohama, Nishio; Hideki Obayashi, Hoi; Tadashi Ozaki, Nishio, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 22, 1978, Ser. No. 908,460
Claims priority, application Japan, May 26, 1977, 52-61393
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**

1. An exhaust gas recirculation system for an internal combustion engine comprising:

an exhaust gas recirculation passage (**21**) communicating an exhaust pipe of an engine with an intake pipe of said engine at a position downstream of a throttle valve disposed in said inake pipe for recirculating a portion of exhaust gases from said exhaust pipe to said intake pipe;

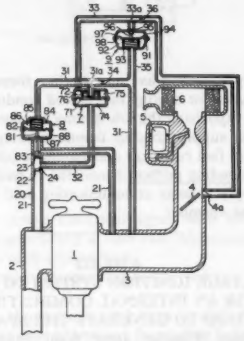
a restriction (**22**) and a valve seat (**23**) respectively disposed in series in said exhaust gas recirculation passage (**21**) for forming a pressure chamber (**24**) in said recirculation passage between said restriction (**22**) and said valve seat (**23**);

a control valve (**8**) having a first diaphragm chamber (**85**), a first deformable diaphragm (**82**) responsive to the pressure in said first diaphragm chamber (**85**), and a valve body (**83**) connected to said first diaphragm for cooperating with said valve seat (**23**) to form a variable orifice;

a pressure pipe (**31**) communicating said first diaphragm chamber (**85**) of said control valve (**8**) with a source of negative pressure in said intake pipe (**3**);

a modulator (**7**) having a second diaphragm (**71**) and a second and a third diaphragm chambers (**74, 75**) divided by said second diaphragm (**71**), said second diaphragm chamber (**74**) being communicated with said pressure chamber (**24**), said third diaphragm pressure chamber (**75**) being communicated with said intake pipe through a throttle port (**4***a*) for modulating the pressure in said first diaphragm chamber (**85**) in response to the pressures in said second and third diaphragm chambers (**74, 75**) of said modulator (**7**), said throttle port (**4***a*) being positioned such that it is upstream of said throttle valve (**4**) when it is closed and it is downstream of said throttle valve (**4**) when it is opened by a predetermined angle; and

a negative pressure control valve (**9**) having a third diaphragm (**91**), and a fourth and fifth diaphragm chambers (**92, 94**) divided by said third diaphragm (**91**), said fourth diaphragm chamber (**92**) being communicated with said intake pipe downstream of said throttle valve, said fifth diaphragm chamber (**94**) being communicated with the atmosphere and with said third diaphragm chamber (**75**) of said modulator (**7**), and means (**95, 96**) connected to said third diaphragm (**91**) for controlling the communication between said fifth diaphragm chamber (**94**) of said negative pressure control valve (**9**) and said third diaphragm chamber (**75**) of said modulator (**7**) to introduce air to said third diaphragm chamber (**7**) in response to the pressure in said fourth diaphragm chamber (**92**), so that the amount of air introduced into said third diaphragm chamber (**75**) is increased in accordance with the increase of the negative pressure in said intake pipe,



whereby the pressure in said pressure chamber (**24**) is decreased in accordance with the increase of the negative pressure in said intake pipe and increase of a rotational speed of said engine.

4,181,111

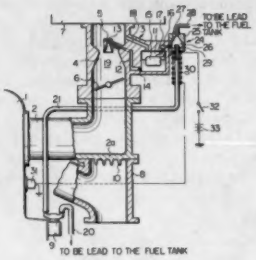
METHOD FOR FEEDING A FUEL AND A FUEL FEED DEVICE FOR USE IN AN INTERNAL COMBUSTION ENGINE

Masakatsu Sanada, Toyota, and Masahiko Nakada, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 24, 1977, Ser. No. 799,918
Claims priority, application Japan, Mar. 17, 1977, 52-28665
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—133 **16 Claims**

6. A fuel feed device of an internal combustion engine, comprising:

a carburetor having a float chamber therein;
a fuel reservoir;
a non-heated separator means having therein a separating chamber for separating bubbles of low boiling components from fuel, said separating chamber having in its lower end a fuel inlet and a fuel outlet, and having in its upper end a bubble outlet which is connected to said fuel reservoir;



a fuel supply conduit having a portion thereof disposed in a heat source for heating fuel in said conduit to create bubbles by vaporizing the low boiling components in the fuel, said fuel supply conduit communicating said fuel inlet with said fuel reservoir and having a substantially vertically extending portion connected to said fuel inlet, and;
a fuel supply passage communicating said fuel outlet with said float chamber.

4,181,112

HIGH-VOLTAGE IGNITION SYSTEM TO GENERATE A SPARK FOR AN INTERNAL COMBUSTION ENGINE, AND METHOD TO GENERATE THE SPARK ENERGY

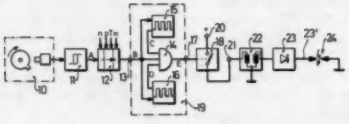
Günter Grüther, Pinache; Josef Wahl, Stuttgart; Friedrich Rabus, Schwieberdingen; Bert Wurst, Möglingen, and Karl-Heinz Adler, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,735

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611596

Int. Cl.[2] F02P *3/04*

U.S. Cl. 123—148 E **22 Claims**



1. In an internal combustion engine ignition system having an ignition coil (22);
a spark gap (24);
connecting means (23') serially connected with the secondary winding of the ignition coil (22) and the spark gap (24) and providing an energy storage means connected to the spark gap;
and a controlled interrupter switch (18) serially connected with the primary winding of the spark coil (22),
a method to generate a high-voltage ignition spark and to cause an ignition event, comprising the steps of
sequentially, in repetitive pulse cycles, applying a charge to the spark energy storage means connected to the spark gap (24);
preventing back-flow of energy away from the energy storage means connected to the spark gap (24);
and building up an energy accumulation in said energy storage means in form of a charge voltage accumulation as the result of said sequentially applied charges to the energy storage means until the energy stored therein causes breakdown of the spark gap,
wherein the step of sequentially applying charges to the spark energy storage means comprises
providing a plurality of pulses (E) having pulse periods (1) and pulse gaps (p) therebetween;
and timing the respective pulse periods and pulse gaps to obtain a built-up charge accumulation in the energy storage means connected across the spark gap sufficient to effect breakdown thereof.

4,181,113

ENGINE IGNITION SYSTEM WITH VOLTAGE MONITORING

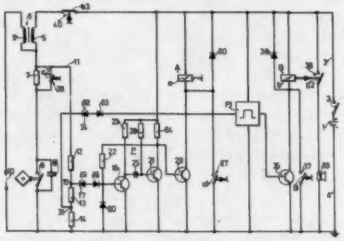
Walter Ruf, Korntal-Münchingen, and Heinz Krauss, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,799

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648517

Int. Cl.[2] F02P *9/00*

U.S. Cl. 123—148 E **12 Claims**

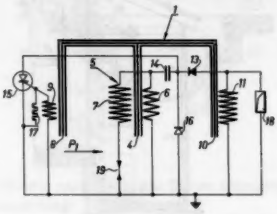


1. An electrical ignition system for an internal combustion engine comprising an ignition voltage transformer having primary and secondary windings, the secondary winding being connected in circuit with at least one spark plug and the primary winding being connected to means for periodically causing a sudden change in current flow through the primary winding so as to induce a spark igniting voltage in the secondary winding, said system also comprising the improvement which consists in that:
at least one monitoring circuit (11) is connected to said primary winding (5) containing at least one component having a substantially constant breakdown voltage (17,32) of such a value that said breakdown voltage is reached as soon as the electrode spacing of said sparkplug (10) connected in circuit with said secondary winding (9) has increased to a predetermined value, said monitoring circuit being so constituted as to operate an electrically controllable switch (28,38,40) when that breakdown voltage is exceeded at said component, said electrically controllable switch having a switching path interposed in a circuit for modifying the operation of the ignition system and/or for producing a warning signal.

4,181,114
CIRCUIT ARRANGEMENT FOR ELECTRONIC IGNITION APPARATUS

Hans T. H. Carlsson, and Leif B. Gustafsson, both of Amål, Sweden, assignors to Aktiebolaget Svenska Elektromagneter, Sweden

Continuation of Ser. No. 679,795, Apr. 23, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,129
Claims priority, application Sweden, Apr. 25, 1975, 7504829
Int. Cl.[2] F02P *3/06;* H05B *41/14;* H02K *21/22*
U.S. Cl. 123—148 CC **5 Claims**



1. An electronic ignition system for use on an internal combustion engine having a spark plug and a flywheel magnet, comprising:

(a) a core having three legs integral with each other and thus magnetically coupled to each other for coacting with at least one pair of passing magnetic poles of the magnet; and

(b) an ignition circuit including

(1) a trigger coil carried on a first one of said legs;

(2) circuit closing means having a control electrode to which said trigger coil is connected;

(3) an ignition coil carried on the middle one of said legs, and having primary and secondary windings, the latter being adapted to be connected to said spark plug;

(4) a charging coil carried by the third one of said legs;

(5) a charging rectifier and a storage capacitor connected in series between said charging coil and said primary winding;

(6) the charging coil, a primary of said ignition coil, and a secondary of said ignition coil having turns wound in the same sense of direction;

(7) the number of turns in said primary compared to the number of turns in said secondary having a ratio within the range of 1:75 to 1:150; and

(8) said trigger coil being adapted to coact with said pair of magnet poles after the flywheel magnet has rotated over 180° past said charging coil, during which rotation said storage capacitor carries a charge;

whereby the dominant voltage in the ignition coil induced by transient oscillations occuring at sparking has a direction opposite to the spark-initiating voltage peak, and whereby the voltage dominating half-periods resulting from said transient oscillations go in a charging direction of said storage capacitor, and whereby said transient oscillations occur just before a full flux alternating sequence arises in said middle leg.

4,181,115
POWER CONTROL OF A STONE CUTTING MACHINE HAVING CUTTING CHAINS

Horst Weisner, Herdecke-Ende, Fed. Rep. of Germany, assignor to Machinenfabrik Korfmann GmbH, Witten, Fed. Rep. of Germany

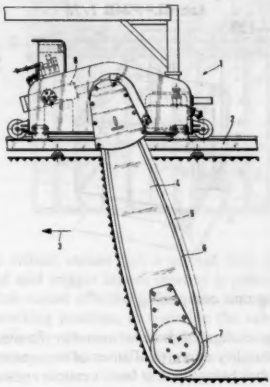
Filed Mar. 3, 1978, Ser. No. 883,215
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709687
Int. Cl.[2] B28D *1/08*
U.S. Cl. 125—21 **4 Claims**

1. A process for cutting stone, comprising the steps of: feeding a cutting machine forwardly on a guide frame at a feed rate;

cutting the stone by means of a rotating stone cutting chain guided on a cutting arm and driven by an electromotor;

producing an electrical control value X correlated to the power fluctuation of the electromotor within a limited scanning period T;

producing an actual elongation signal correlated to the feed rate;



comparing the actual electrical signal with the electrical value X and producing a feed rate adjustment signal Y correlated to such comparison;

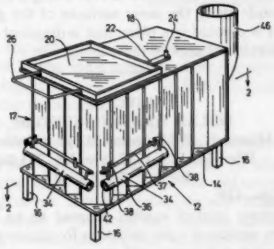
adjusting the feed rate according to the feed rate adjustment signal Y; and

conducting the above-mentioned steps so that the scanning period T in the case of a power fluctuation below the fixed minimum value is approximately twice as long as the scanning period T in the case of a power fluctuation exceeding the fixed maximum value for the power consumption of the electro-motor.

4,181,116
STOVE

Ernest Sedore, Mount Albert, Ontario L0G 1M0, Canada

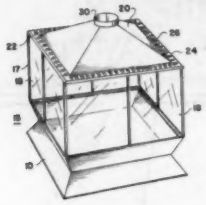
Filed May 18, 1978, Ser. No. 907,230
Int. Cl.[2] F24C *1/00;* F23L *13/06*
U.S. Cl. 126—60 **9 Claims**



1. A stove comprising a body for receiving wood fuel, said body having a surrounding wall at least a substantial part of the periphery of which has vertical corrugations, said vertical corrugations having an outer side in direct contact with the atmosphere and an inner side directly contactable by the wood fuel, and air inlet means comprising apertures in the outer crests of the corrugations for supplying air from the atmosphere to the inner side of the corrugations and thereby to

vertical channels formed between the corrugations and adjacent wood in the stove.

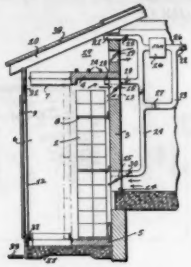
4,181,117
FIREPLACE
Harold W. Hannebaum, 420 Walnut St. East, Bellevue, Id. 83313
Continuation-in-part of Ser. No. 762,014, Jan. 24, 1977, abandoned. This application Oct. 20, 1977, Ser. No. 843,827
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **4 Claims**



1. A heating unit comprising
a firebox;
a vertically elongated hollow member formed primarily with a plurality of vertical sides of transparent material, said member being open at both vertical ends and secured at its lower end to the firebox; and
a hollow top section formed with a central chimney outlet having a relatively small open end conforming to and engaging the upper end of said vertically elongated hollow member, said section having a narrow horizontal peripheral border with openings in said border communicating with the upper interior of said vertially elongated hollow member, said border having essentially the same perimeter as that of said member, in which
said horizontal border has a plurality of manually adjustable louvers therein, each associated with an individual such opening and located so that, in use, air is drawn into the member through each opening and oriented by each said louver along a vertically downwardly extending swirling path and is discharged upwardly through a chimney joined to the said small open end of the hollow top section, with
each said louver oriented to pivot about an axis perpendicular to a vertical side of the said hollow member, adjacent to said louver, such that air drawn through an opening is directed by an associated louver along a downward path sidewards along the inner surfaces of the glass when the louver is pivoted in a plane that is diagonal to the vertical and horizontal axes of the heating unit.

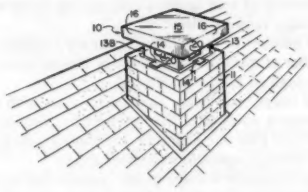
4,181,118
SOLAR HEATING SYSTEM
Harold B. Mummert, 508 Peterson St., Fort Collins, Colo. 80524
Filed Feb. 25, 1977, Ser. No. 771,969
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—429 **5 Claims**

1. A climate control system adapted to be used with an intermittent source of solar radiation for altering the temperature of a building interior, said system comprising:
storage means including material capable of absorbing the radiation from said source and positioned in the path of said radiation,
insulating means disposed to form a retractile enclosure around storage material, including:
at least one movable portion retractably positionable so that said insulating means encloses said storage material when said movable portion is in one position and said insulating means exposes said storage material to radiation when said movable portion is in a second position; and
further including a second wall portion positioned between said storage material and the building interior, said second wall portion having at least two vent means, each of said vent means defining a passage through said second portion between the storage material and said



interior and including control means for selectively opening and closing said passage, said passages being vertically spaced from each other so that when said vent means are open and there is a temperature differential between the storage material and the building interior, a convection current is set up between the area of the storage material and the interior of the building.

4,181,119
COMBINED CHIMNEY COVER AND DAMPER
Herbert H. Lyles, 153 McAlway Rd., Charlotte, N.C. 28211
Filed Mar. 6, 1978, Ser. No. 883,384
Int. Cl.[2] F23L *3/00*
U.S. Cl. 126—286 **8 Claims**

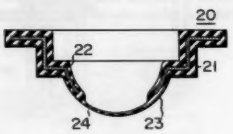


1. A cover and damper for a chimney, said cover and damper comprising
(a) an elongated sleeve having an open end and a closed end,
(b) support means extending laterally from the sleeve in spaced relation to the open end of the sleeve and engagable with the top of the chimney to support the sleeve on the chimney with the open end inside the chimney and said closed end above the chimney, said closed end extending across the chimney and defining a stationary cover for the chimney;
(c) the portion of the sleeve between the support means and the closed end of the sleeve having at least one aperture therein establishing communication between the atmosphere and the interior of the sleeve,
(d) a damper slidably mounted within the sleeve, and
(e) means for varying the position of the damper relative to the aperture in the sleeve to selectively open and close the aperture.

4,181,120
VESSEL FOR ULTRASONIC SCANNER

Yutaka Kunii, and Toshikuni Shimoji, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 21, 1977, Ser. No. 789,745
Claims priority, application Japan, Apr. 23, 1976, 51-46154; Mar. 18, 1977, 52-30093
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—660 7 Claims



1. An ultrasonic sector scanner for an ultrasonic diagnosis apparatus comprising:

a vessel body containing an ultrasonic transmission medium;

a protection cap made of an elastic material forming a wall of said vessel, said protection cap including a frame portion comprising a relatively thick section of elastic material with a rigid inner member imbedded therein such that said frame portion has reinforcing characteristics and a high ultrasonic energy absorption capacity, and a thin elastic window portion readily penetrable by ultrasonic energy, a section of said frame portion and said window portion being configured to form an outward projection in said vessel wall having a substantially semicircular cross-section which retains substantially the same shape when brought into contact with the skin of a patient due to the reinforcing characteristics of the frame portion of said projection;

an ultrasonic probe for transmitting and receiving an ultrasonic beam, said ultrasonic probe being supported within said body and immersed in said medium such that the transmitting and receiving elements of said probe are positioned in proximity to the inner surface of said projection; and

means for pivoting said ultrasonic probe relative to said protection cap through a predetermined sector scan angle such that said transmitting and receiving elements of said probe are moved in a scan path substantially parallel to the semicircular contour of said projection, whereby the section of said vessel wall including said projection is adapted to be pressed against the skin of a patient to position said ultrasonic probe in close proximity to the tissue areas of said patient to be diagnosed.

4,181,121
SERIAL RELEASE MECHANISM AND DRAINAGE MONITOR EMBODYING THE SAME

George F. Schwoboda, New Brighton, and Robert C. Wingrove, Afton, both of Minn., assignors to Medical Devices, Inc., St. Paul, Minn.

Filed Nov. 2, 1977, Ser. No. 847,701
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—762 2 Claims

1. A discharge monitor comprising, in combination:

(1) a liquid collector including a series of storage chambers, a header for supplying liquid to said chambers, and collapsible tubes connecting said chambers to said header; and

(2) a control unit for serially causing collapse of said tubes to cut off passage for liquid to said chambers, said control unit including

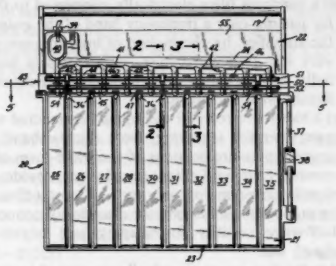
(a) a series of actuators normally urged resiliently into first, working positions;

(b) trigger means releasably holding said actuators in second, withdrawn positions;

(c) trigger release means effective in a first state, when operated, to release said trigger means;

(d) means for operating said trigger release means;

(e) disabling means normally effective to actuate said



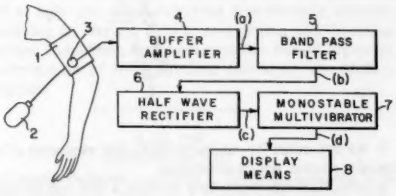
trigger release means into a second state in which release of said trigger means thereby is prevented; and

(f) override means effective, when any actuator in a series is in working position, to override the release disablement of only the next actuator in the series, so that successive operation of the operating means causes successive release of said actuators singly in series.

4,181,122
DEVICE FOR MEASURING BLOOD PRESSURE

Kazuo Ueda, Tokyo, Japan, assignor to Ueda Works Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 601,572, Aug. 1, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,638
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—680 1 Claim



1. A device, for indicating the presence and absence of Korotkoff sound in the measurement of intermediate blood pressure measuring according to RIVA ROCCI, comprising:

(i) a microphone composed of

(a) a housing having an opening;

(b) a support member of resilient material in said housing, said support member being an elongated single-piece body having a central recess and first and second longitudinal grooves formed symmetrically adjacent the respective ends of the body and opening upwardly and inwardly therein, said support member fitting snugly within said housing, in the lower part of said recess of said support member a support plate made of rigid material being secured by adhesive;

(c) a ceramic element positioned within said housing and having its ends engaged in said first and second grooves and with a major central part thereof intermediate said ends overlying said recess so as to be in spaced relationship from said support member;

(d) a diaphragm secured on said housing over the opening thereof, and a connecting element made of resilient

material and disposed centrally of said ceramic element and positioned between and connected to said ceramic element and said diaphragm for transmission of vibrations of said diaphragm to said ceramic element;

(ii) a buffer amplifier electrically connected to said microphone for amplifying asymmetrical alternating current signals emitted by the microphone;

(iii) a bandpass filter electrically connected to the amplifier for passing only a frequency band of the output signal of the amplifier, by elimination of high frequency noise and very low frequency noise, such that said band substantially includes only the fundamental frequency of the Korotkoff sound signal;

(iv) a half-wave rectifier electrically connected to the bandpass filter for removing, from the passband signal, the positive pressure portions of the wave-form of the signal coming from said filter, thereby to provide a negative signal corresponding only to the Korotkoff sound;

(v) a monostable multivibrator electrically connected to the half-wave rectifier for shaping said negative-pressure signal; and

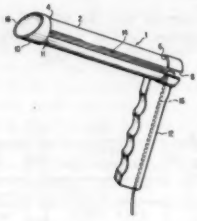
(vi) indicating means electrically connected to the monostable multivibrator for indicating the shaped negative-pressure signal.

4,181,123

APPARATUS FOR CARDIAC SURGERY AND TREATMENT OF CARDIOVASCULAR DISEASE

Ivan K. Crosby, Charlottesville, Va., assignor to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Dec. 28, 1977, Ser. No. 865,173
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—6 **6 Claims**



1. An apparatus for cardiac surgery and treatment of cardiovascular disease which comprises:

a cylindrical member which includes a first and second open end portion, an inner and outer wall portion, and a slot connecting said inner and outer wall portions;

annular guard means having a continuous circumference attached at said first end portion of said cylindrical member and forming an extension of said cylindrical member, said guard means also having an outer surface radius which is greater than a radius of said cylindrical member and which connects to said slot; and,

maneuvering means connected to said outer wall portion adjacent said second open end portion of said cylindrical member;

wherein said slot extends from said second end portion to terminate at said guard means.

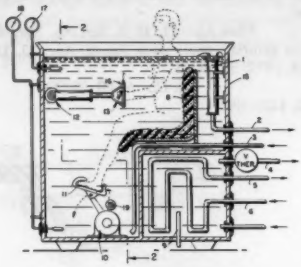
4,181,124

THERAPEUTIC IMPLODER

Joseph Pauletich, 91-18 43rd Ave., Elmhurst, N.Y. 11373

Filed Jun. 2, 1977, Ser. No. 802,882
Int. Cl.[2] A61H *9/00*; A63B *21/00*
U.S. Cl. 128—66 **3 Claims**

1. A therapeutic assembly comprising a tank, a wave generating imploder situated in said tank, a seat disposed in said tank, hand and feet exercise members located proximate said seat, said hand exercise member having means for affording tor-



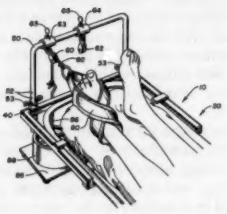
sional and straight line movement exercise for the user of said assembly.

4,181,125

PORTABLE TRACTION DEVICE

Richard C. Carlson, Box 262, and Gary R. Van Vleet, Box 64, both of Beach, N. Dak. 58621

Filed Oct. 5, 1977, Ser. No. 839,404
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **6 Claims**



1. A portable traction device adapted to be mounted on a portable patient transfer cart comprising, a U-shaped bracket member having a base portion and leg portions each having dimensions adapted to fit over the end of the frame and along the longitudinal members of the portable patient transfer cot, said leg portions having flanges extending transversely therefrom at the ends of the leg portions and intermediate the ends of the leg portions and the base portion of the bracket member, said flanges being adapted to engage the frame of the cot and retain the bracket member thereon against movement, a pair of apertures positioned in the base portion of the bracket member near the leg portions thereof, and a U-shaped pulley bar having its legs releasably mounted in the apertures in the base portion of the bracket member and extending normal thereto, said pulley bar having pulley means which are movable transversely with respect to the base portion of the bracket member.

4,181,126

CRYOGENIC, UNDERWATER-BREATHING APPARATUS

Stephen M. Hendry, 7526 Jerez Ct., No. 3, Carlsbad, Calif. 92008

Filed Jan. 23, 1978, Ser. No. 871,751
Int. Cl.[2] A62B *7/06*; B63C *11/22*
U.S. Cl. 128—201.21 **11 Claims**

1. A cryogenic, underwater-breathing apparatus comprising:

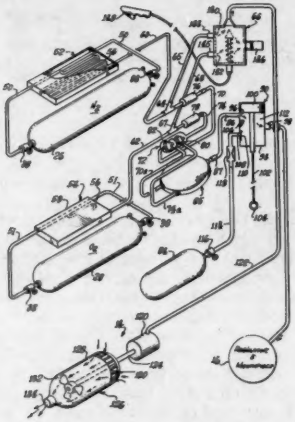
a first tank having liquid nitrogen stored therein;

a second tank having liquid oxygen stored therein;

a pair of heat exchangers defining a gas-expansion chamber, each heat exchanger being connected to respective first and second tanks of liquid nitrogen and oxygen, whereby said gases therefrom pass through said respective heat exchangers;

a gas-mixing chamber connected to both of said heat exchangers wherein said nitrogen and oxygen are mixed together as breathable air under a predetermined pressure;

a shuttle-valve means operably interposed between said heat exchangers and said mixing chamber, whereby gases under equal pressure from said tanks are allowed to flow through said shuttle valve means under a balanced condition, and whereby gases under unequal pressure from said tanks cause said shuttle-valve to become unbalanced, preventing gases from flowing therethrough and entering said mixing chamber;



a pair of low-pressure regulator means, each being operably interposed between respective heat exchangers and said shuttle valve means, whereby the gas pressure from each tank is equalized prior to entering said shuttle valve; and

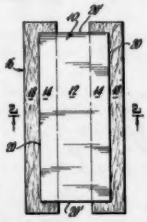
a mouthpiece regulator operably interconnected to said mixing chamber so as to receive the mixed gases from said mixing chamber for breathing by the diver while submerged underwater.

4,181,127

BALANCED ENVIRONMENT WOUND DRESSING

Cary B. Linsky, East Brunswick, and David T. Rovee, Somerset, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jun. 29, 1978, Ser. No. 920,530
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—155 **6 Claims**



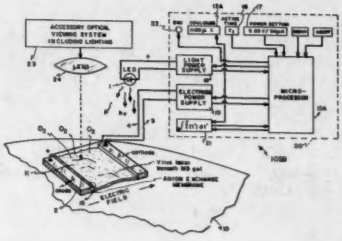
1. A wound dressing comprising an imperforate flexible sheet having a wound cover portion adapted to be placed in contact with and cover a wound, and an absorbent for wound exudate, said absorbent overlying at least a portion of said imperforate flexible sheet and extending beyond at least a portion of the edge of said flexible sheet, wherein said flexible sheet has an adherence of less than about 20 gm/cm^2 and an MVT of at least about 0.08 mg/cm^{2}hr, the distance between any point on said wound cover portion of said flexible sheet and an edge of said flexible sheet beyond which said absorbent extends is sufficiently short to prevent accumulation of wound exudate under said wound cover portion, and the MVT of said dressing is at least about 0.06 mg/cm^2/hr.

4,181,128

VIRUS INACTIVATION APPLICATOR AND THE LIKE

Mitchell R. Swartz, Malden, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 636,290, Nov. 28, 1975, Pat. No. 4,139,348. This application Feb. 21, 1978, Ser. No. 879,822
Int. Cl.[2] D61M *37/00*
U.S. Cl. 128—207.21 **13 Claims**



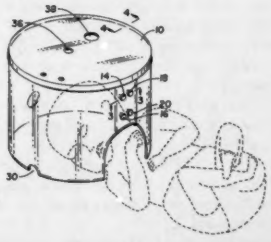
1. A method of inactivating Herpes simplex virus, in vivo, that comprises applying to the region occupied by the Herpes simplex virus a solution containing a component capable of assuming an excited electronic state when said component is subjected to light and an electric field concurrently; concurrently applying an electric field to said region and directing light thereon; and adding hydrogen peroxide to said region to enhance formation of hydroxyl free radical by the Haber-Weiss reaction.

4,181,129

INFANT HOOD

Leon R. Cameto, Oakland, and John R. Edmund, Berkeley, both of Calif., assignors to MistO_2Gen Equipment Company, Oakland, Calif.

Filed Jan. 25, 1978, Ser. No. 871,887
Int. Cl.[2] A61M *16/02*
U.S. Cl. 128—205.26 **7 Claims**



1. An improved hood for covering an infant's head and providing a generally controlled environment, said hood being of the type having a cover plate and side walls having an

opening for the infant's head and at least one other opening for the introduction of a gas, wherein the improvement comprises:

a generally flat sheet, said sheet being flexible so as to contact opposite ends of said sheet with one another, thereby forming generally cylindrically configured side walls;

a generally circularly shaped cover plate having a flange extending from the peripheral edge, said flange having an internal diameter sufficiently exceeding that of the cylindrically configured side walls so as to provide a substantially tight fit therewith; and

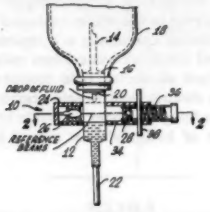
means for releasably securing said opposite ends of said sheet to one another so as to maintain said side walls in a generally cylindrical configuration.

4,181,130

DROP DISCRIMINATOR SYSTEM

Wilber H. Bailey, Leucadia, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Nov. 4, 1977, Ser. No. 848,567
Int. Cl.[2] A61M 5/16
U.S. Cl. 128—214 E **43 Claims**



1. In a drop detection system for use with fluid flow control apparatus, in the parenteral administration of liquids through a feeding tube from a liquid source to a patient, the combination comprising:

first means for generating electrical signals in response to detection of drop flow activity;

second means for receiving said electrical signals to determine the occurrence of individual drops;

third means, responsive to said second means, for providing drop signals indicative of drop flow events to the fluid flow control apparatus;

fourth means, also responsive to said second means, for qualitatively evaluating the waveforms of each of said electrical signals representing individual drop configurations to determine their conformity with prescribed waveform characteristics, whereby proper drop flow events may be qualitatively distinguished from improper drop flow events; and

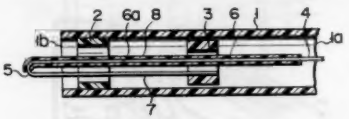
fifth means, responsive to the electrical output of said fourth means, for providing an indication of nonconformity in the waveform characteristics of a prescribed number of said electrical signals to determine proper operation of the fluid flow control apparatus.

4,181,131

HIGH FREQUENCY ELECTROSURGICAL INSTRUMENT FOR CUTTING HUMAN BODY CAVITY STRUCTURES

Hisao Ogiu, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,347
Claims priority, application Japan, Feb. 28, 1977, 52-21339; Feb. 28, 1977, 52-21340
Int. Cl.[2] A61B 17/36
U.S. Cl. 128—303.15 **16 Claims**



1. A high frequency electrosurgical instrument for cutting human body cavity structures including:

an electrically insulated sheath having proximal and distal ends;

a metal wire member extending through the sheath and having a bend which extends from the distal end of the sheath and at which the metal wire member is folded back toward the distal end of the sheath, said metal wire member adapted to be connected to a high frequency source by means for effecting electrical connection therebetween and comprising an operating wire constituted by that portion of the metal wire member which extends through the sheath and which lies between the bend and the proximal end of the sheath and has a distal end portion extendable from the distal end of the sheath, means for reciprocating the operating wire at the proximal end of the sheath, and a cutting wire constituted by that portion of the metal wire member which is folded back toward and lies between the bend and the distal end of the sheath, with one end thereof remote from said bend held by the sheath, said cutting wire being kept substantially straight and fixed in length no matter how far the distal end portion of said operating wire is extended from the distal end of the sheath; and

an electrically insulated, flexible wrapping member mounted on the distal end portion of the operating wire.

4,181,132

METHOD AND APPARATUS FOR EFFECTING HYPERTHERMIC TREATMENT

Leon C. Parks, 1001-C Pleasant Oaks Rd., Baltimore, Md. 21234

Filed May 31, 1977, Ser. No. 802,033
Int. Cl.[2] A61F 7/00
U.S. Cl. 128—399 **29 Claims**

8. Apparatus for hyperthermic treatment of a human patient for the purpose of retarding the growth of cancer cells in the patient which comprises:

means defining a sterile extracorporeal flow path for blood having an inlet, an outlet and a temperature control zone therebetween,

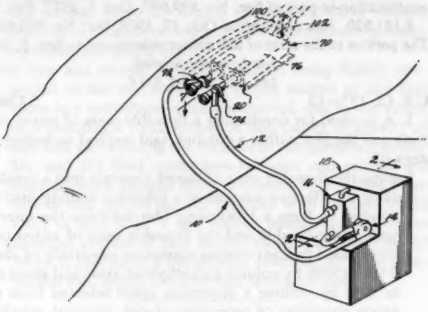
means for establishing communication of the inlet of said extracorporeal flow path with the patient's bloodstream so that blood can be withdrawn and supplied to said extracorporeal flow path without adversely affecting the blood circulation in the areas from which the blood is withdrawn,

means for establishing communication of the outlet of said extracorporeal flow path with the patient's bloodstream so that blood flowing from the extracorporeal flow path is returned to the bloodstream in such a way as to be distributed systemically,

means for pumping blood withdrawn from the patient's

bloodstream along said extracorporeal flow path through said temperature control zone at a controlled rate of at least approximately 1 liter per minute and returning the same to the patient's bloodstream to be distributed systemically, as aforesaid, and

means for controlling the temperature of the blood flowing along said extracorporeal flow path through said temperature control zone for an initial period during which the temperature level of the blood within the zone is raised without causing the same to reach localized temperatures



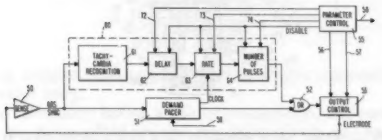
in excess of approximately 45° C. so that the systemic distribution of the returned blood gradually increases the patient's core body temperature to a generally stable temperature condition at a level of approximately 41.5° C. but not higher than approximately 42.5° C., and for maintaining control of the temperature of the blood flowing along said extracorporeal flow path through said temperature control zone at said generally stable temperature condition for a second time period sufficient to effect the desired treatment.

4,181,133

PROGRAMMABLE TACHYCARDIA PACER

Steve A. Kolenik, Leechburg, and Robert A. Walters, Murrysville, both of Pa., assignors to Arco Medical Products Company, Leechburg, Pa.

Filed May 22, 1978, Ser. No. 907,659
Int. Cl.[2] A51N *1/36*
U.S. Cl. 128—419 PG **10 Claims**



1. Programmable apparatus adapted for implantation in a patient, and providing the dual functions of cardiac pacing and delivery of tachycardia breakup pulses upon occurrence of tachycardia in said patient, comprising:

a. pacing means for providing pacing timing signals in the absence of natural patient heartbeats, said pacing means including a clock generator which generates clock pulses independently of patient heartbeat signals;

b. means for detecting the condition of tachycardia in said patient;

c. tachycardia means for generating tachycardia timing signals in response to said detected tachycardia, said tachycardia means being connected to said pacing means and generating said tachycardia timing signals from said clock pulses;

d. programmable control means for controlling at least one variable of said tachycardia timing signals and for generating output control signals; and

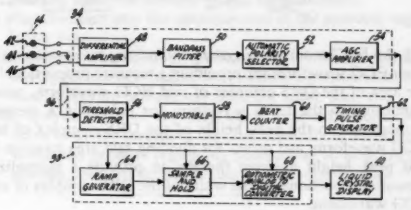
e. common programmable output means connected to receive said pacing timing signals and said tachycardia timing signals, and connected to be controlled by said output control signals, for generating and delivering to said patient output pulses in response to each of such timing pulses.

4,181,134

CARDIOTACHOMETER

Richard C. Mason, 19 Goodale Cir., New Brunswick, N.J. 08901, and John D. Petronis, 93 Long Hill Rd., Little Falls, N.J. 07424

Filed Sep. 21, 1977, Ser. No. 835,478
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—689 **15 Claims**



1. A cardiotachometer apparatus comprising:

a pick-up means for picking up electrical signals from heart beats;

an initial signal processing means having an input connected to said pick-up means and an output, said initial signal processing means including an amplifier means therein;

a signal recognizing means having an input connected to the output of said initial signal processing means, said signal recognizing means including a heart beat counter means for counting said heart beats and producing an output once for every Nth heart beat, N being equal to or greater than 2, said output occuring at intervals T apart;

a reciprocal generating means for producing an output directly proportional to 1/T, said reciprocal generating means including:

a ramp generator having an input and an output, the input of said ramp generator being connected to the output of said signal recognizing means;

a sample-and-hold means having at least two inputs and one output, one of said sample-and-hold inputs being connected to the output of said ramp generator and one of said other inputs of said sample-and-hold generator being connected to the output of said signal recognizing means; and,

a ratiometric dual/slope analog-to-digital conversion means having at least two inputs and one output, at least one of said inputs to said ratiometric dual/slope analog-to-digital conversion means being connected to the output of said sample-and-hold means and at least one of the other of said inputs of said ratiometric dual/slope analog-to-digital conversion means being connected to the output of said signal recognizing means; and,

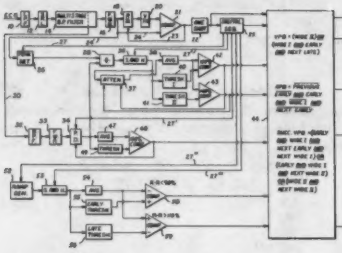
a display means for producing a visual output, said display means being connected to said reciprocal generating means, the output of said display means being directly proportional to the heart beat rate between outputs of said counter means.

4,181,135

METHOD AND APPARATUS FOR MONITORING ELECTROCARDIOGRAPHIC WAVEFORMS

Richard P. Andresen, Belmont; Robert M. Armington, Boston; Robert L. Cannon, III, Waltham, and Andrew J. Griffin, Framingham, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 3, 1978, Ser. No. 883,096
Int. Cl.[2] A61N 5/04
U.S. Cl. 128—703 **12 Claims**



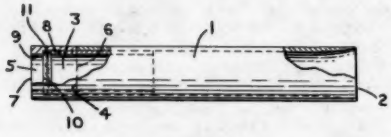
1. An ECG monitoring system comprising means responsive to an ECG waveform for providing a measure proportional to the area of the QRS complex of said ECG waveform, means responsive to the ECG waveform for providing a measure proportional to the peak height of the QRS complex of said ECG waveform, and means for dividing said area measure by said peak height measure thereby to provide a normalized measure proportional to the width of the QRS complex of said ECG waveform.

4,181,136

PIPE FOR DRAWING SMOKE THROUGH AND EXTRACTING JUICE FROM A PIECE OF FRUIT

Alfred D. Baldwin, 409 Twin Oak Rd., Short Hills, N.J. 07078

Filed Aug. 10, 1978, Ser. No. 932,426
Int. Cl.[2] A24F 1/32
U.S. Cl. 131—171 R **1 Claim**



1. A device for smoking tobacco and the like while sucking a piece of fruit, the device comprising:

a hollow first tube having a sharpened edge at one end and a sleeve at the other end, the sharpened edge capable of carving a substantially L-shaped passageway within the piece of fruit by a vertical first insertion meeting with a horizontal second insertion, said tube resting within the horizontal insertion sharpened edge first;

hollow second tube having a larger inside diameter at one end and a smaller inside diameter at the other and forming internally a lip, the smaller diameter slidable over the sleeve of the first tube, said second tube resting within the vertical insertion smaller diameter first;

a screen positionable across the cross section of the second tube resting on the lip and on to which tobacco is placed whereby a suction applied to the sleeved end of the first tube causes smoke from the ignited tobacco to flow through the second tube thereby contacting the pulp and the fruit's juice which accompany the smoke leaving the fruit via the first tube, said screen matable with the lip and the sleeved edge of the first tube when the second tube is slid over the sleeve; and

means for connecting the first and second tubes when the second tube is positioned on the sleeve.

4,181,137

METHOD FOR PULLING CABLE AND CONDUCTING MIXED CONCRETE

Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125

Division of Ser. No. 896,105, Apr. 13, 1978, which is a continuation-in-part of Ser. No. 839,077, Oct. 3, 1977, Pat. No. 4,111,820. This application Oct. 27, 1978, Ser. No. 955,663
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C10M 3/14
U.S. Cl. 137—13 **5 Claims**

1. A method for conducting a flowable mass of mixed concrete and the like within a conduit, said method including the steps of:

feeding the flowable mass of mixed concrete into a conduit,

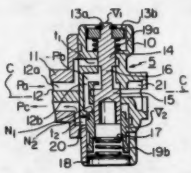
feeding an effective amount of a lubricant coating into the conduit to form a lubricating film between the internal wall of the conduit and the flowable mass of mixed concrete, said lubricant coating consisting essentially of about 0.5% to 50% by volume polyethylene oxide and about 6% to 30% by volume a dispersion agent selected from the group consisting of propylene glycol, glycerol, ethylene glycol, polypropylene glycol, diethylene glycol, triethylene glycol and hexylene glycol, the ratio of the volume of polyethylene oxide to the volume of said dispersion agent being about 1:3 and the remainder being water.

4,181,138

GOVERNOR VALVE ASSEMBLY FOR AUTOMATIC TRANSMISSION UNITS

Toshio Takano, Hino, Japan, assignor to Fuji Heavy Industries Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1977, Ser. No. 854,248
Claims priority, application Japan, Nov. 30, 1976, 51/159315[U]
Int. Cl.[2] G05D 13/36
U.S. Cl. 137—54 **7 Claims**



1. A governor valve assembly for a hydraulic control system of an automatic transmission unit for producing a hydraulic governor pressure from a hydraulic line pressure, comprising:

a rotatably supported governor shaft;

a governor body fixed to one end of the governor shaft to be rotated with said governor shaft about an axis of rotation of the governor shaft;

a first valve member slidably fitted in said governor body;

a second valve member slidably fitted in said governor body and arranged to be coaxial and telescopical with said first valve member and including a shoulder portion, said first and second valve members having a center of gravity thereof, respectively, located on the opposite sides of said axis of rotation of said governor shaft;

a first pressure passage formed in said governor body for introducing therein an operating fluid of the hydraulic line pressure;

a second pressure passage formed within said governor body

to be fluidly connectable to and disconnectable from said first pressure passage due to a sliding motion of said first valve member in said governor body;

a third pressure passage formed in said governor body to be fluidly connectable to and disconnectable from said second pressure passage due to a sliding motion of said second valve member, said third pressure passage being capable of delivering a controlled fluid of the governor pressure upon being connected to said second pressure passage; and

a spring element mounted between said governor body and said second valve for urging said second valve toward said axis of rotation of said governor valve assembly under a preselected spring force;

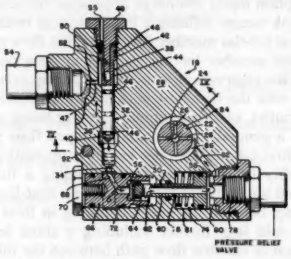
said first and second pressure passages being fluidly connected to one another by the sliding motion of said first valve in a centrifugal direction thereof, due to the action of a centrifugal force acting on said center of gravity of said first valve during the rotation of said governor assembly, and the fluid connection between said second and third pressure passage being increased by the fluid pressure in said second passage together with the centrifugal force of said fluid in said second passage acting on the shoulder portion of said second valve while said second valve is moved in a centrifugal direction so as to overwhelm said spring force of said spring element.

4,181,139

MULTIPLE FUNCTION CO_2 VALVE

Leonard J. Martini, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1977, Ser. No. 853,722
Int. Cl.[2] G05D *16/10*
U.S. Cl. 137—68 A **5 Claims**



1. A compact fluid pressure regulation valve comprising:

a valve body;

the valve body having a pair of passageways, one passageway being a fluid pressure regulating passageway and the other passageway being a high pressure fluid supplying passageway;

the fluid supplying passageway extending substantially perpendicular to the pressure regulating passageway and having a downstream end which opens into an upstream portion of the pressure regulating passageway;

the fluid supplying passageway having on and off modes for supplying high pressure fluid to the pressure regulating passageway;

means for activating the fluid supplying passageway from an off mode to an on mode;

means within the pressure regulating passageway for utilizing the pressure therein as a back pressure to regulate the pressure of the fluid flowing therethrough;

the valve body having a low pressure fluid outlet passageway which has an upstream portion which is connected to a downstream end portion of the pressure regulating passageway and a downstream portion which exits the valve body;

the upstream portion of the outlet passageway extending substantially at an acute angle to the pressure regulating passageway back toward the fluid supplying passageway in substantially the same plane as the pressure regulating and fluid supplying passageways;

the downstream portion of the outlet passageway extending substantially perpendicular to said plane;

the valve body having a high pressure fluid inlet passageway which communicates with the fluid supplying passageway for delivering high pressure fluid thereto;

the inlet passageway extending substantially perpendicular to the fluid supplying passageway and substantially parallel to the downstream portion of the outlet passageway;

a valve seat in the upstream portion of the pressure regulating passageway for delivering the fluid;

a hollow piston and hollow piston rod mounted in the pressure regulating passageway downstream from the valve seat, the piston rod being open to fluid delivered at the valve seat and having a valve head at its upstream end for cooperating with the valve seat to restrict the flow depending upon the amount of said back pressure;

a plug threaded into the upstream end of the pressure regulating passageway;

said plug forming said valve seat at its downstream end and having an interior passageway which communicates the fluid supplying passageway with the valve seat; and

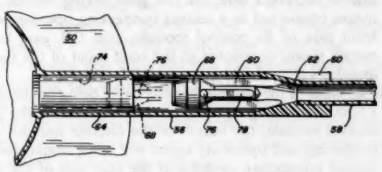
the upstream end of the plug being exposed exterior the valve body for threading the plug inwardly or outwardly within the pressure regulating passageway so as to set the spacing between the valve seat and said valve head.

4,181,140

FRANGIBLE RESEALABLE CLOSURE FOR A FLEXIBLE TUBE HAVING HOLD OPEN MEANS

Edward L. Bayham; Ronald A. Williams, both of Mundelein, and David W. Ammann, Lindenhurst, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 10, 1978, Ser. No. 876,790
Int. Cl.[2] A61M *5/14*
U.S. Cl. 137—68 R **9 Claims**



1. In a flexible tube, valve means positioned in said tube, said valve means comprising: a tubular portion having a closed end, an elongated, generally rigid member carried on the exterior of said closed end and positioned within said flexible tube, and frangible means to permit the opening of said tubular portion adjacent said closed end by rupture of an area of weakness by manual manipulation of the elongated member from outside of the flexible tube, causing separation of the elongated member from said tubular portion, said elongated, generally rigid member generally defining longitudinal vanes to provide flow channels along its length, the improvement comprising, in combination: at least some of its vanes extending rearwardly of the end of the central portion of said rigid member, said flexible tube defining a bore portion positioned to receive and resiliently hold said extending vanes without closing said flow channels when the frangible means is broken and said rigid member is separated from the tubular portion, to prevent accidental reclosing of the said tubular portion opening by the rigid member moving to obstruct said tubular portion.

4,181,141

PNEUMATIC CIRCUIT ARRANGEMENT

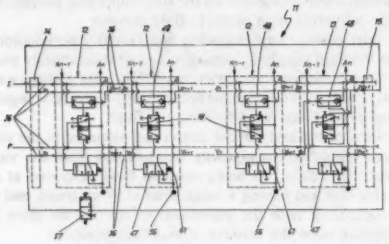
Kurt Stoll, Lenzhelde 72, 7300 Esslingen, and Manfred Rüdle, Thomasäckerweg 17, 7300 Esslingen-Berkheim, both of Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,668

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704869

Int. Cl.[2] F15B *13/07*

U.S. Cl. 137—119 **3 Claims**



1. A fluidic control for the cyclic successive actuation of a plurality of pressure-medium consumers, said fluidic control including control modules which are carried by a frame, each control module being associated with a said consumer, said control modules being constructed similarly, said control modules abutting one another at their opposed sides, such that a given module has a rear side abutting the front side of the preceding module and a front side abutting the rear side of the next following module, said control modules containing an AND gate and an OR gate and a bistable impulse valve;

the AND gate of a given control module having input means for receiving an operating signal produced by said given control module for its associated consumer and also for receiving an acknowledgment signal which indicates the end of the operation of its said associated consumer, the AND gate having output means connected with a first connecting opening in the front side of its control module;

the OR gate having first input means connected to a reset channel which runs through its control module from one side to the other side, the OR gate having second input means connected to a second connecting opening in said front side of its control module, said OR gate having output means connected to the reset input of the bistable impulse valve of said given control module;

the set input of the bistable impulse valve being connected to a first connecting opening in the rear side of the given control module, the output of the bistable impulse valve producing said operating signal and being connected to a second connecting opening in the rear side of the given control module, the first and second connecting openings in the front side of a said control module being aligned with the first and second connecting openings of the rear side of the opposed control module;

a start valve pretensioned into its off position and connected into a feedback line from the output means of the AND gate of the last control module to the set input of the bistable impulse valve of the first control module, and comprising the improvement wherein:

the control modules each include a connection plate, said connecting openings being in the front and rear sides of said connection plate, said connection plate carrying connecting means for connecting to the associated consumer and connecting means for receiving said acknowledgment signal;

a logic plate which contains said AND gate and said OR gate; and

an intermediate plate which lies between said connection plate and logic plate and has connecting channels therethrough connecting said connection plate and logic plate, said intermediate plate of the last control module having modified connecting channels therethrough, one of said modified connecting channels connecting said first connecting opening in said rear side to the one input means of said OR gate of the last control module, the other input means of the last mentioned OR gate being connected to said reset channel, the output of said last OR gate being connected to the set input of the bistable impulse valve of the last control module, a further one of said modified connecting channels connecting the reset input of the bistable impulse valve of the last control module to the second connecting opening in said front side of the last control module, the latter front side abutting an output module.

4,181,142

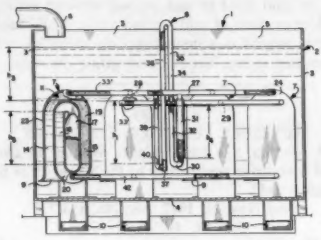
SIPHON APPARATUS

John A. George, Uniontown, Kans.

Filed Aug. 3, 1977, Ser. No. 821,404

Int. Cl.[2] F04F *10/00*

U.S. Cl. 137—124 **15 Claims**



1. A siphon liquid discharge apparatus including:

(a) a tank means defining a liquid storage reservoir; and

(b) a first tubular member forming a first flow path, said first tubular member having an inlet in flow communication with the reservoir and an outlet opening exteriorly of said tank with the first flow path extending between said inlet and outlet, said first tubular member being configured to form a generally conchoidally-shaped flow path portion, said first tubular member having a plurality of legs and a plurality of traps, said legs including a first leg and a second leg and said legs including a first liquid trap connecting the first leg and second leg in flow communication, said legs further including a third leg forming a portion of the first flow path between the inlet and a first air trap, said first air trap connecting the third leg and first leg in flow communication and a fourth leg connected in flow communication to the second leg and forming a portion of the first flow path between the second leg and the outlet, said first, second, third and fourth legs are generally parallel, said second leg and a portion of the fourth leg are positioned generally between said first leg and third leg.

4,181,143

VALVE ASSEMBLY AND COUPLER THEREFOR

Merton R. Fallon, Thousand Oaks, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Filed Sep. 28, 1977, Ser. No. 837,450

Int. Cl.[2] F16K *51/00*; **F16L** *37/00*; **B65D** *83/00*

U.S. Cl. 137—322 **46 Claims**

1. A valve sealing arrangement for sealing a container of fluid comprising:

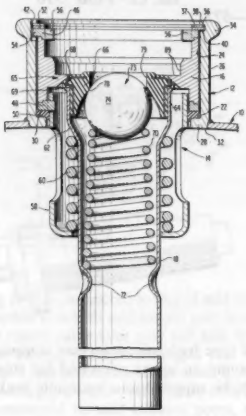
(a) a valve assembly for providing access to said container;

(b) a valve assembly receiving member secured to said container;

(c) a deformable sealing member;

(d) said valve assembly having a body portion with a seal engaging surface;

(e) said sealing arrangement including a non-threaded retaining member for insertion between said valve assembly and said receiving means for deforming and compressing said seal member between said seal engaging surface of said valve assembly and said receiving member for effecting a



seal between said valve assembly and said receiving member; and,

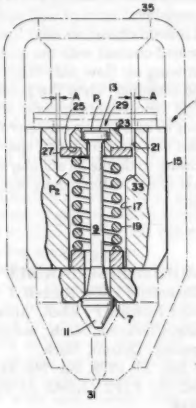
(f) safety delay means for retaining said valve assembly within said receiving member when the container is under pressure should said retaining member become disengaged thereby allowing for gas to be released from the container prior to removal of said valve assembly.

4,181,144

HYDRAULICALLY LIMITED FUEL INJECTION NOZZLE

Ernest W. Landen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1977, Ser. No. 863,489
Int. Cl.[2] F16K *17/34*
U.S. Cl. 137—484.4 **1 Claim**



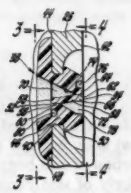
1. In an injection nozzle operable by fluid under pressure including a cylindrical valve body assembly having a portion defining a valve seat; an elongated check valve having an enlarged first end to engage the valve seat and an enlarged second end; a sleeve disposed about said check valve and disposed in said valve body assembly, said sleeve associating said check valve with said valve body assembly; resilient means disposed between said seat and said enlarged second end and interior of said sleeve, said resilient means for urging said check valve into engagement with said seat, said check valve movable out of engagement with said seat by fluid under pressure acting on said first end thereby creating a flow of fluid through said sleeve, the improvement comprising lift control means including a lift control washer disposed between said second end of said elongated check valve and said resilient means, said lift control means cooperating with said sleeve for providing a pressure gradient in a flow of fluid passing thereby, said pressure gradient acting on said lift control washer to move said check valve further out of engagement with said seat; whereby a relative greater amount of fluid is passed through the injection nozzle for a given pressure.

4,181,145

TWO-WAY CHECK VALVE

Clarence I. Mitchell, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1978, Ser. No. 904,317
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—493.8 **2 Claims**



1. A self-retaining and sealing valve insert assembly for sealing a confined air space in a disc brake or the like and for substantially equalizing the air pressure in the confined air space with ambient air pressure, said valve insert assembly being made of a rubber-like material and comprising:

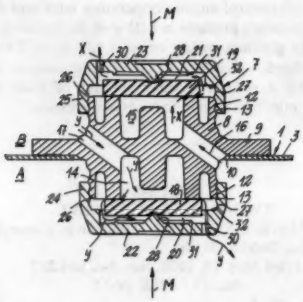
a body having side walls and first and second axially spaced mounting and sealing flanges formed thereon for holding and sealing said valve insert assembly in an opening provided in a portion of the disc brake defining a wall having the confined air space on one wall side and ambient air pressure on the other wall side,

said body having formed therein a pair of normally closed duckbill check valves each of which terminates with a valve slit and each of which opens and closes in an axially opposite direction relative to the other so that one of said pair of duckbill check valves will open to permit movement of air in one direction through the valve insert assembly and the other of said pair of duckbill check valves will open to permit movement of air in the opposite direction through the valve insert assembly upon predetermined pressure differentials thereacross, said duckbill check valves' side walls including a first common flexible wall with the axially opposite wall edges thereof each defining one side of the valve slit of one of said pair of duckbill check valves, and another side wall of each of said pair of duckbill check valves having an axially extending recess providing a flexible other side of the valve slit of one of said pair of duckbill check valves cooperating with said one side thereof to open and close the valve slit formed therebetween for valving action in response to a pressure differential.

4,181,146
TWO-WAY VALVE CLOSING AT BALANCED PRESSURE CONDITION

Luigi Goglio, Via Solari 10, 20144 Milan, Italy

Filed Jul. 21, 1977, Ser. No. 817,731
Int. Cl.[2] F16K *17/168*
U.S. Cl. 137—493.9 4 Claims



1. A valve assembly for use in a container having a wall defining at least part of the interior of the container comprising: a body member adapted to be fixed to said wall such that an inner portion of said body member extends into said container and an outer portion of said body member extends into the atmosphere exteriorly of said container, an inner recess having an open end formed in said inner body member portion, first conduit means formed in said body member adapted to fluidly communicate said inner recess and the outer atmosphere, an outer recess having an open end formed in said outer body member portion, second conduit means formed in said body member adapted to fluidly communicate said outer recess and the interior of said container;

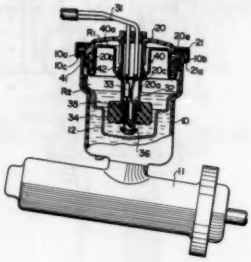
means for selectively alternately providing a one-way fluid path from said inner recess to the container interior and for sealing said inner recess therefrom comprising a first deformable member located over the open end of said inner recess and manually adjustable means for selectively urging the outer peripheral regions of said first deformable member into sealing engagement with the body member to close the open end of the inner recess; and

means for selectively alternately providing a one-way fluid path from said outer recess to the external atmosphere and for sealing said outer recess therefrom comprising a second deformable member located over the open end of said outer recess and manually actuatable means for selectively urging the outer peripheral regions of said second deformable member into sealing engagement with the body member to close the open end of the outer recess, so that a first one-way fluid flow path is defined for selectively conducting and obstructing the flow of fluids into the container interior from the external atmosphere comprising said first conduit means, said inner recess and said first deformable member and so that a second one-way fluid flow path is defined for selectively conducting and obstructing the flow of fluids into the external atmosphere from the containers interior comprising said second conduit means, said outer recess and said second deformable member.

4,181,147
SEALED TYPE HYDRAULIC RESERVOIR

Takashi Fujii, Toyota; Atsushi Ohmi, Anjo; Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 4, 1977, Ser. No. 848,562
Claims priority, application Japan, Nov. 5, 1976, 51-133524
Int. Cl.[2] F15B *7/10*
U.S. Cl. 137—572 9 Claims



1. A sealed type hydraulic reservoir comprising:

a casing having an upper open end for storing brake fluid therein to be supplied to a hydraulic brake master cylinder;

a cap member detachably mounted on the upper open end of said casing;

an elastic seal member, said seal member being movable in response to variations in atmospheric pressure within said casing between upper and lower predetermined positions, the outer peripheral brim thereof being secured to said cap member for sealing the brake fluid stored in said casing;

a first chamber within said reservoir and defined between the under side of said cap member and the upper side of said seal member, said first chamber being in communication with the atmosphere through a vent hole provided in said cap member;

a second chamber within said reservoir and defined between the under side of said seal member and the liquid surface of said brake fluid, said second chamber being normally sealed by said seal member to maintain the pressure therein at the atmospheric level; and

a first check valve means including a first annular lip formed at the outer peripheral brim of said seal member between said first and second chambers, said first annular lip being normally in sealed contact with the inside side wall of said casing for allowing air flow only from said first chamber to said second chamber when the pressure in the second chamber drops below atmospheric level and said seal member moves to said lower predetermined position, the sidewall of said cap member being spaced from the inside wall of said casing to define an annular space between said walls, said first check valve means being disposed in said annular space.

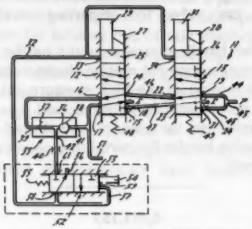
4,181,148
SELF MONITORING DOUBLE VALVE

Neil E. Russell, Bloomfield Hills; Russell J. Cameron, Rochester, both of Mich.; Richard P. Zbell, Allison Park, Pa., and Lloyd L. Schmaltz, Clarkston, Mich., assignors to Ross Operating Valve Company, Detroit, Mich.

Filed Jun. 23, 1978, Ser. No. 918,599
Int. Cl.[2] F15B *13/043, 13/044*
U.S. Cl. 137—596.16 16 Claims

1. A double safety valve comprising two main valves, shifting means for said main valves, a fluid control line for said shifting means, a shuttle check valve having a pair of inlet ports and an outlet port leading from between said inlet ports and

interconnected with said control line, whereby said control line is pressurized in response to pressurizing of either one or both of said inlet ports and exhausted in response to exhausting of both inlet ports, a working port connectable to a unit to be controlled by said double valve, a pressurized fluid supply port leading to one of said main valves, and exhaust ports leading from both of said main valves, the main valves being movable in synchronism between a first position in which said supply port is connected to one of said shuttle check valve inlet ports



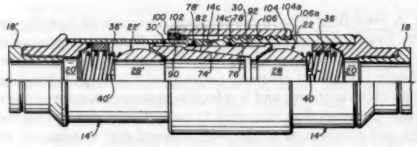
and said working port is connected to one of said exhaust ports, and a second position in which said supply port is connected to the other shuttle check valve inlet port and said working port, said main valves having ports so arranged that when either main valve is in said first position and the other is in said second position, said working port and both shuttle check valve inlet ports will be connected to said exhaust ports, said shifting means being responsive to exhausting of said control line to urge both main valves toward said first position.

4,181,149

QUICK DISCONNECT ROTARY VALVE COUPLING

Don C. Cox, Smithfield, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 7, 1977, Ser. No. 785,365
Int. Cl.[2] F16L *37/10, 37/28*
U.S. Cl. 137—614.02 **27 Claims**



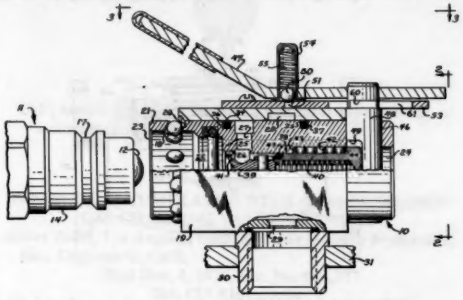
1. A coupling comprising:
two coupling sections, each of which includes:
housing having a bore extending therethrough,
a ball valve axially movable and rotatable within the bore of said housing between a first position closing the bore and a second position opening the bore,
said ball valve being pivotally connected to said housing section, and having a sliding, pivot means responsive to axial movement of said ball valve within the bore of said housing for rotation of said ball valve,
means for seating said ball valve,
means for resiliently urging said ball valve to said first position closing the bore, said resilient urging means automatically moving said ball valve and said seating means to said first position closing the bore when said two coupling sections are separated;
one coupling section having a female nose guide means,
the other coupling section having a male nose guide means engageable with said female nose guide means in a non-sealing configuration,
means, independent of said nose guide means, for releasably joining said two coupling sections together,
said joining means advancing said two housings together, causing said ball valve and seating means to be moved axially within the bore of the housings and simultaneously cause rotation of said ball valve to said second position opening the housing bore.

4,181,150

LEVER-TYPE QUICK DISCONNECT COUPLING

Ojars Maldavs, Lincoln, Nebr., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Sep. 12, 1977, Ser. No. 832,182
Int. Cl.[2] F16L *37/22*
U.S. Cl. 137—614.06 **7 Claims**



1. A lever-type quick disconnect female coupling for coaction with a check-valve equipped male coupling, the female coupling comprising:
(a) an outer tubular housing;
(b) a generally tubular inner housing having
(i) a forward end and a rearward end,
(ii) an axially extending bore open at said forward end for receipt of said male coupling,
(iii) a valve seat in said bore spaced rearwardly from said open forward end,
(iv) a port extending generally transversely through the housing rearwardly of the valve seat and adjacent thereto;
(c) a valve slidably mounted in said bore and movable between a first position in which the valve engages said valve seat and blocks fluid flow between said port and said open forward end and a second position in which the valve is moved forwardly of the valve seat to permit fluid to flow between said port and said open end, said valve being adapted to engage the check valve of the male coupling as said valve moves forwardly from its first position to its second position;
(d) seal means in said bore between the inner housing and the valve rearwardly of the port for preventing the flow of fluid in the bore rearwardly of the seal means;
(e) cam means mounted on the inner housing rearwardly of the seal means for moving said valve from its first position to its second position while said valve seat remains stationary; and
(f) a lever conneted to said cam means for moving the cam means.

4,181,151

DIAPHRAGM VALVE

Harold W. Ensign, Fullerton, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.

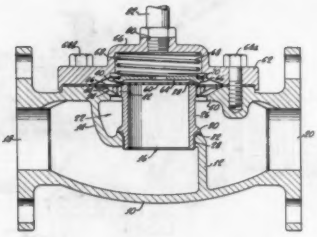
Filed Mar. 17, 1977, Ser. No. 778,685
Int. Cl.[2] F16K *7/17*
U.S. Cl. 137—625.28 **14 Claims**

1. A diaphragm valve comprising
a valve body,
a plate support in said body,
a diaphragm plate formed with a plurality of passages and

having a hollow trunk mounted on said support and separating said valve body into input and output chambers, one of said chambers including a portion within said trunk and the other of said chambers including a portion exterior to said trunk,

a valve cover connected to said body on one side of said plate to define therewith an operation chamber,

a diaphragm having its outer periphery fixed to said body and extending across said chamber and across said diaphragm plate, said diaphragm having portions adjacent said passages that are flexible and relatively unrestrained whereby such diaphragm portions may flex to peel from said diaphragm plate passages to progressively cover or



uncover more area of said passages as more of said diaphragm is displaced from or toward said passages,

a retainer plate having a diameter at least equal to the diameter of said hollow trunk, said retainer plate being positioned in said operating chamber between said cover and diaphragm and in contact with said diaphragm, and

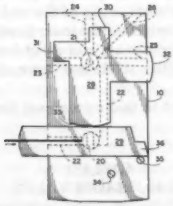
means for urging said retainer plate toward said diaphragm plate, said diaphragm being fixed at points at its periphery corresponding to points of said valve body, said points of said diaphragm being spaced from one another by greater distances than said points of said valve body whereby the diaphragm is free to bend at various portions thereof without stretching, said diaphragm being free of attachment except at its periphery.

4,181,152

CONTROL MANIFOLD

Nicholas Nicoloff, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,752
Int. Cl.[2] F16K *35/14*
U.S. Cl. 137—637.1 **7 Claims**



1. An apparatus for controlling the venting of pressurized gas from a launcher comprising:

a manifold block provided with a high pressure gas passage, a receiver tank passage, a piston return passage, a snubber passage, and a vent passage, the manifold block is further provided with a vent recess communicating with all the aforestated passages and a high pressure gas recess communicating with the high pressure gas passage;

a high pressure gas valve rotatably mounted in the high pressure gas recess having a lateral bore selectively rotated to be in communication with the high pressure gas passage;

a venting valve rotatably mounted in the vent recess having a port selectively rotated to communicate the vent passage with the high pressure gas passage, snubber passage, piston return passage and the receiver tank passage;

high pressure gas valve handle means mounted on the high pressure gas valve for imparting rotational motion thereto;

venting valve handle means mounted on the venting valve for imparting rotational motion thereto and for blocking rotational motion of the high pressure gas valve handle means at predetermined positions; and

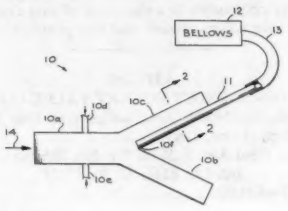
means mounted on the manifold block and engaging the venting valve handle for permitting only a one-way rotation thereof.

4,181,153

FLUIDIC-AMPLIFIER DEVICE HAVING TUBE IN OUTLET CHANNEL

Gene W. Osheroff, Las Vegas, Nev., assignor to McQuay-Perfiex, Inc., Minneapolis, Minn.

Filed Aug. 24, 1977, Ser. No. 827,148
Int. Cl.[2] F15C *1/08*
U.S. Cl. 137—838 **2 Claims**



1. A pure-fluid device comprising: a pure-fluid bistable amplifier having an input channel, a pair of diverging outlet channels forming a splitter there between and a pair of control channels, said outlet channels respectively having rectangular-shaped cross-sections; and a velocity-pressure recovery tube of circular cross-section mounted in one of said outlet channels along and contiguous to the wall thereof that is adjacent the splitter, the mouth of said tube being positioned adjacent the apex of said splitter and the cross-sectional area of said tube being not more than twenty percent of the cross-sectional area of the outlet channel in which it is mounted.

4,181,154

DEFLECTOR VALVE FOR FLUIDS

Leonard Oley, Hunlock Creek, and Joseph Stachnik, Moscow, both of Pa., assignors to ARA Services, Inc., Philadelphia, Pa.

Filed Feb. 27, 1978, Ser. No. 881,707
Int. Cl.[2] F16K *11/14*
U.S. Cl. 137—863 **3 Claims**

1. A deflector valve for fluid comprising:

a housing defining a central transverse bore through the entire thickness of said housing, said housing further defining a first partial bore extending through less than the thickness of said housing, and a second partial bore extending through less than the thickness of said housing, said first and second partial bores having openings on opposite sides of said housing;

an inlet port connected to said housing and communicating with said central transverse bore;

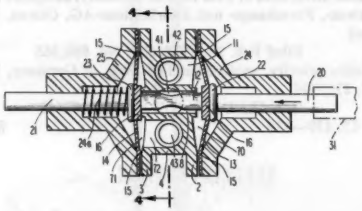
first and second outlet ports connected to said housing and communicating respectively with said first and second partial bores;

a pair of diaphragms attached to the sides of said housing, said diaphragms being of sufficient size to cover the openings created by said central transverse bore and said partial bores;

means for alternately extending either of said diaphragms away from said housing, wherein either of said diaphragms when extended completes a path for fluid flow from said inlet port to one of said outlet ports;

spring means for holding one of said diaphragms in an extended position relative to said housing;

wherein said diaphragm extending means comprises a pair of piston means, said piston means being positioned to push on said respective diaphragms from outside said housing, and an operating pin located in said central transverse bore, said operating pin being of sufficient length to experience force simultaneously from both of said piston means;



wherein one of said piston means is spring-biased, and wherein said piston means and said operating pin are configured substantially along a straight line, and wherein the force exerted by said spring-biased piston means against one of said diaphragms tends to block fluid flow from said central transverse bore, and wherein the force exerted by said diaphragm and said operating pin tends to extend said other diaphragm and to permit fluid flow from said central transverse bore into one of said partial bores;

further comprising a pair of piston guides, said guides defining cavities permitting slidable movement therein of said piston means, wherein said guides abut said diaphragms and are attached to said housing, wherein said diaphragms are firmly held between said housing and said piston guides, and wherein the attachment forms two watertight enclosures defined by said housing in both of said diaphragms;

wherein said member has at least one transverse recess and at least one longitudinal recess, said longitudinal recess extending throughout the length of said member.

4,181,155

PRESSURE ENERGY ACCUMULATOR

Gustaaf A. Wesselink; Adrianus J. J. Franken, and Hendricus F. G. Smulders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1978, Ser. No. 915,130

Claims priority, application Netherlands, Jun. 13, 1977, 7706448

Int. Cl.² F16L *55/02*

U.S. Cl. 138—30 **1 Claim**

1. A pressure energy accumulator comprising a reservoir containing a hydraulic liquid and a gaseous working medium separated by a movable flexible partition to permit the gaseous working medium to be compressed, said gaseous working medium consisting at least substantially entirely of a mixture of:

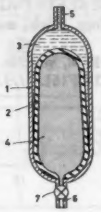
CF_4 and N_2 having a least 5 and at most 80 mol% N_2;

CF_4 and H_2 having at least 5 and at most 85 mol% H_2;

CF_4 and He having at least 5 and at most 85 mol% He;

C_2F_6 and N_2 having at least 40 and at most 90 mol% N_2;

C_2F_6 and H_2 having at least 20 and at most 90 mol% H_2;



C_2F_6 and He having at least 20 and at most 90 mol% He; or a combination thereof.

4,181,156

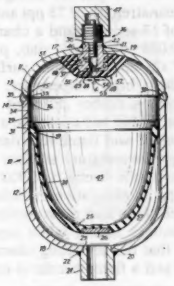
PRESSURE ACCUMULATOR WITH ANTI-EXTRUSION GAS CHARGING VALVE ASSEMBLY

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Dec. 4, 1978, Ser. No. 966,377

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **8 Claims**



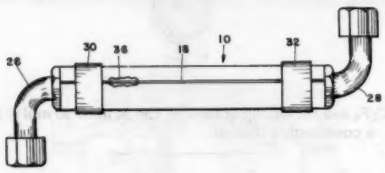
1. A pressure vessel comprising a container of rigid material having a liquid port at one end and gas port at its opposite end axially aligned therewith, a deformable bladder of resilient material in said container between said ports, a gas charging fitting extending through said gas port and secured therein, said fitting having a base portion in said container and an axial stem protruding from said container, an axial bore extending through said base portion and stem, said bore having an inner end and an outer end, an internally threaded portion near the outer end of the bore, a gas charging valve adapted to be mounted in said internally threaded outer end portion, a deformable cap mounted on said base portion, said cap having a relatively thick portion thereof extending across the base portion over the inner end of the bore the extending portion of said cap having a tapered passageway therethrough axially aligned with the inner end of said bore in said gas charging fitting, said tapered passageway in the extending portion of the cap being in the form of a truncated cone having its wider diameter base end adjacent the inner end of said bore and its smaller diameter truncated end remote from the inner end of said bore, said extending portion of the cap being of a thickness, and the tapered passageway being of a length, whereby the portion of the cap surrounding the truncated end of the passageway is generally radially inwardly deformable relative to and across said passageway to effect a sealing of said passageway upon

forceable engagement of the deformable bladder against the portion of the cap about the truncated end.

4,181,157
FIRE SLEEVING

Douglas A. DeCamp, Hastings, Mich., assignor to Flexfab, Inc., Hastings, Mich.

Filed Jan. 3, 1978, Ser. No. 866,547
Int. Cl.[2] F16L *11/12*
U.S. Cl. 138—126 **10 Claims**



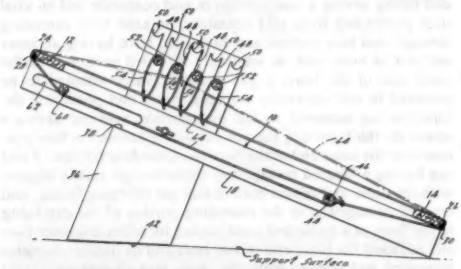
1. An article for insulating tubular hydraulic lines, fuel lines and the like to provide protection from extreme temperatures associated with a fire, said article comprising:

a silicone polymer coated glass fiber sheet, said sheet being self coiling and having a normally coiled generally cylindrical configuration, one surface of said sheet being coated with a flame retardant, flame supporting volatile free silicone rubber having a Shore A Durometer of 40, a tensile strength of 900 psi, an elongation modulus of 700%, a Die B tear strength of 75 ppi and flame resistance characteristics of 12 seconds and a char length of 1 inch based upon a 0.075 inch thick slab, press molded five minutes at 116° C., and the other surface of said sheet being coated with a high temperature, flame supporting volatile free silicone rubber different from said flame retardant silicone rubber and coated to a thickness greater than the thickness of said flame retardant silicone rubber coating, said high temperature silicone rubber having a Shore A of 54, a tensile strength of 900 psi, a Die B tear strength of 55 ppi, an elongation modulus of 300% based upon a 0.075 inch thick slab press molded ten minutes at 150° C., said coatings ashing when exposed to extreme temperatures so that the insulating characteristics of said article increases and a flame barrier is created.

4,181,158
PORTABLE TABLE LOOM

Robert L. Kidd, Birmingham, Mich., assignor to Ray Frost Fleming, Birmingham, Mich.

Filed Mar. 27, 1978, Ser. No. 890,471
Int. Cl.[2] D03D *29/00*
U.S. Cl. 139—33 **4 Claims**

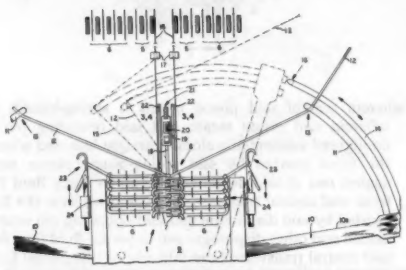


1. A portable table loom comprising a rigid rectangular frame including a top reed member and a bottom reed member interconnected by side members, upstanding support members rigidly connected to said side members intermediate the ends of said side members with the upwardly projecting portions thereof forming opposed and facing parts of the harness system and with the downwardly projecting portion providing with the bottom end of the frame the loom support, the facing parts of the harness system being formed with a plurality of upwardly opening and inwardly facing U-shaped channel grooves adapted to receive harness rods, said harness rods adapted to support heddles positionable within said channel grooves for pre-selected pattern positioning therein, the ends of the harness rods terminating closely adjacent the bottoms of the U-shaped channel grooves, and a warping rod extending transversely of the frame between the bottom reed member and the support members, said warping rod being slightly shorter than the space between the side members and being removably received in either one of two opposed openings formed in the side members.

4,181,159
METHOD OF AND APPARATUS FOR MAKING A SLIDE-FASTENER STRINGER

Alfons Fröhlich, Essen, and Horst Ranalli, Wintersberg-Niedersfeld, both of Fed. Rep. of Germany, assignors to OPTI Patent-, Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Feb. 23, 1978, Ser. No. 880,365
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707946
Int. Cl.[2] D03D *47/00, 47/02, 47/42*
U.S. Cl. 139—116 **8 Claims**



1. A method of making a slide fastener string which comprises the steps of:

(a) laying a warp comprising a first set of warp threads adapted to be formed into a woven tape of one stringer half and a second set of warp threads adapted to be formed into a tape of another stringer half;

(b) shedding said warp;

(c) entraining a synthetic-resin monofilament from opposite sides of said warp into the sheds thereof and across and around a mandrel disposed between said sheds of warp threads to form respective coupling elements along confronting edges of said tape while inserting said coupling element as wefts in groups of the warp threads of each set along said edges;

(d) simultaneously with the entrainment of said monofilament into the sheds of the warp,

(d_1) picking up a respective ground weft thread at a central region of the warp with a swinging needle,

(d_2) entraining the picked up ground weft thread across one set of warp threads through the other set to an outer side of the warp, thereby inserting said weft thread in the shed of said other set,

(d_3) forming a loop of the weft thread thus inserted at an outer side of said other set,

(d_4) withdrawing the needle across both sets thereby releasing the picked up weft thread at said central region, and

(d_5) repeating steps (d_1) to (d_4) with a needle swung across

said other set with pickup of another ground weft thread and its insertion into said one set;

(e) knitting a loop of each weft thread in the respective outer side into loops of previously inserted weft;

(f) beating up the weft formed by said weft threads and synthetic-resin monofilament; and

(g) repeating steps (b) to (f) to form the slide fastener stringer.

4,181,160

METHOD AND SYSTEM FOR CHECKING THE INTRODUCTION OF A FILLER PIPE INTO A TANK

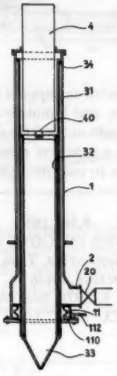
Pierre Heitz, Puteaux, France, assignor to Copagnie d'Etudes et de Realisation de Cybernetique Industrielle, Paris, France

Filed May 12, 1978, Ser. No. 905,441

Claims priority, application France, May 16, 1977, 77 14983

Int. Cl.² B65B *3/04*; B67C *3/34*

U.S. Cl. 141—1 **5 Claims**



1. A method of checking the position of a fluid product filler pipe in relation to the bottom of a tank to be filled with the fluid, the method comprising introducing said pipe into said tank, under the control of a double-acting jack controlled by a hydraulic circuit comprising pressure detecting means for stopping movement of said filler pipe into said tank if an obstacle is encountered thereby, measuring the volume of hydraulic fluid passing through said jack supply circuit, transmitting information derived from said measurement and representing the position of the end of said filler pipe, and continuously comparing said transmitted information with corresponding stored information representing the position of said tank bottom.

4,181,161

METHOD OF PRODUCING A HIGH VACUUM IN A CONTAINER

Thaddaüs Kraus, Triesen, Liechtenstein, assignor to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dünne Schichten, Liechtenstein, Liechtenstein

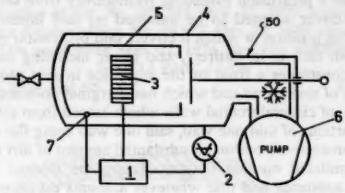
Filed Oct. 13, 1978, Ser. No. 951,241

Claims priority, application Switzerland, Oct. 20, 1977, 01278/77

Int. Cl.² B65B *31/00*; C23C *13/00*

U.S. Cl. 141—8 **5 Claims**

1. A method of improving the efficiency or reproductability of the treating of products by producing a high vacuum in a container having limiting walls defining a reaction chamber which chamber is adapted to be evacuated for vacuum processing purposes and in which gases are sorbed in the container during vacuum operation and the sorbed gases are subsequently removed by increasing the temperature of the walls while the reaction chamber is evacuated comprising, heating the walls of the chamber while the chamber is being evacuated, sensing the under pressure in said reaction chamber during the evacuation, and controlling the heating of the walls in accordance with the sensed pressure in a manner such that the underpressure remains within a preselected upper and lower limit value until a predetermined temperature of the walls is attained.



4,181,162

VENDING APPARATUS

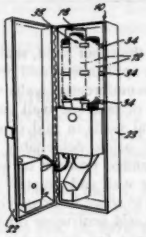
Alec T. Newman, and David Rhodes, both of Banbury, England, assignors to General Foods Limited, Banbury, England

Filed Nov. 23, 1977, Ser. No. 854,239

Claims priority, application United Kingdom, Dec. 1, 1976, 50171/76

Int. Cl.² B67C *3/00*

U.S. Cl. 141—105 **21 Claims**



1. Vending apparatus for vending containers comprising: a body having a discharge point; and a delivery system for containers mounted in the body and comprising means for holding a generally vertically extending stack of containers, means disposed adjacent the lower end of the means for holding, for releasing containers, one by one, from the lower end of the stack, means, disposed below the means for releasing, movable into and out of the path of travel of the released container for receiving the container falling from the stack to tilt temporarily the container at an angle to its path of travel, dispensing means mounted in the body to the side of the stack towards which the container is angled, for dispensing a charge of material into the angled container and means to guide the container from the receiving means to the discharge point.

4,181,163

COMPACT KITCHEN APPLIANCE

Rolf G. Schüllein, Singhofen, Fed. Rep. of Germany, assignor to Leifheit International Gunter Leifheit GmbH, Nassau, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,173

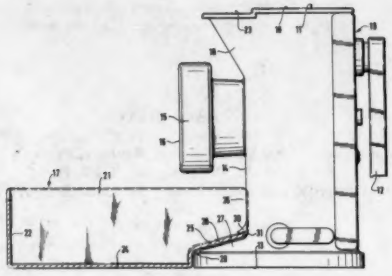
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645247

Int. Cl.² B65B *3/06*

U.S. Cl. 141—381 **8 Claims**

1. A kitchen appliance, particularly, a meat grinder, vegeta-

ble slicer and the like, comprising a housing of a generally rectangular cross section having a base for supporting the appliance, a top wall remote from said base, a pair of lateral walls extending between said base and said top wall, a front face, and a protrusion extending frontwardly from said front face; a cover adapted to be mounted on said housing in a protective position in which it covers said protrusion and also said front face in its entirety, said cover including one wall which constitutes a front of the appliance in said protective position of said cover and which has marginal portions, and a plurality of circumferential walls which extend from said marginal portions of said one wall, said one wall being flat so that in said protective position no substantial amount of dirt or dust is accumulated on said housing during the storage of the kitchen appliance and that whatever amounts do accumulate on said housing during such storage are easily removable, on the one hand, and the kitchen appliance is easy and convenient



for packaging, on the other hand, said one wall which constitutes a front of the appliance in said protective position of said cover and said circumferential walls which extend from said marginal portions of said one wall constituting extensions of said top and lateral walls in said protective position of said cover, said cover being detachably connectable with said housing in an extended position in which said cover is supported on said one wall and situated underneath said protrusion for said cover to serve as a receiving container for materials emerging from said protrusion during the operation of the appliance; and means for detachably connecting said cover with said housing in said extended position and including interengaging formations provided in said cover and said housing, said interengaging formation including projection formed on said base and extending frontwardly beyond said front face, and a depression formed in said one wall of said cover in which depression said projection of said base is received in said extended position of said cover.

4,181,164

HEADSTOCK FOR A PANEL CUTTING MACHINE

Alberto Meniconi, Loc. Bellavista 48, Poggibonsi (SI), Italy

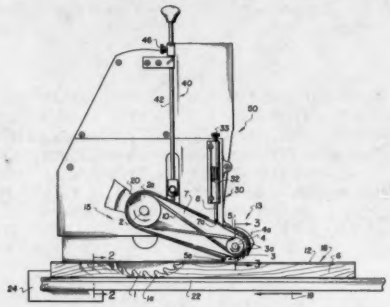
Filed Jun. 1, 1978, Ser. No. 911,421

Claims priority, application Italy, Jun. 7, 1977, 9477 A/77

Int. Cl.[2] B27C *5/00, 9/04*

U.S. Cl. 144—3 R **9 Claims**

1. A headstock of a panel cutting machine for cutting panels having a laminate, said headstock comprising: conveyor means for feeding a laminated panel in a feed direction on a feed path; a first shaft perpendicular to said path; panel cutting means comprising a disc blade rotatably mounted on said shaft and disposed in and aligned with said feed path of cutting the panel; panel cutting drive means comprising a motor connected to said panel cutting means for rotating said panel cutting means and cutting the panel; a second shaft parallel to said first shaft; rotary laminate cutting means comprising a rotary milling blade rotably mounted on said second shaft and disposed in the feed path in front of said panel cutting means in said feed direction and in alignment with said panel cutting means for cutting the laminate of the panel; laminate cutting drive means connecting said motor to said laminate cutting means for rotating said laminate cutting means in a direction to cut in towards said panel and tangentially in the same direction as the feed direction of said panel; support means pivotally mounted on



said first shaft of said motor to support said second shaft of said laminate cutting means; and laminate cutting pressure means connected to said laminate cutting means for biasing said laminate cutting means at a selected pressure onto the exposed surface of said laminate to cut through said laminate.

4,181,165

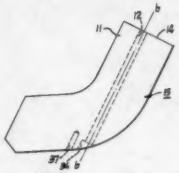
MANUFACTURE OF GOLF CLUB HEADS

John M. Ramsay, Hendersonville, Tenn., assignor to True Temper Corporation, Cleveland, Ohio

Filed Apr. 6, 1978, Ser. No. 894,029

Int. Cl.[2] B27C *7/00, 5/00*

U.S. Cl. 144—325 **15 Claims**



1. In a process for forming from a blank a golf club head having a hosel for receiving a golf club shaft, the improvement comprising: rotating said blank about an axis of rotation which passes through the section of said blank for forming said hosel and which is coincident with the centerline axis along which said golf club shaft is to be secured to said golf club head, and forming said golf club head by contacting said blank with a shaping means as said blank is rotated.

4,181,166

WOOD SPLITTING IMPLEMENT

Dale A. Jones, Rte. 1, Palmetto, Ga. 30268

Filed Jan. 28, 1977, Ser. No. 763,534

Int. Cl.[2] B26B *23/00*

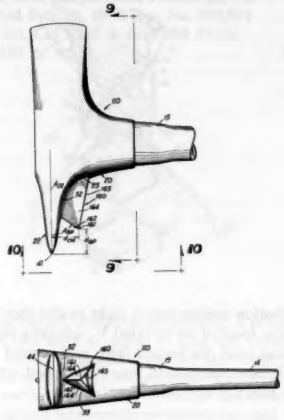
U.S. Cl. 145—2 R **5 Claims**

1. A wood splitting implement adapted to be manually swung in operation by an operator to split tree blocks into firewood including:

an elongate handle having a longitudinal handle axis, and including a gripping section at one end to be manuualy gripped by the operator and a head carrying section at the opposite end; and

a splitting head mounted on said head carrying section of said handle, said splitting head including a cross edged

splitting blade extending outwardly from one side of said handle, said cross edged splitting blade defining a splitting edge on the outboard end thereof oriented generally transversely of said handle axis; and holding means carried by said splitting head and operatively associated with said cross edged splitting blade to engage, at a position spaced

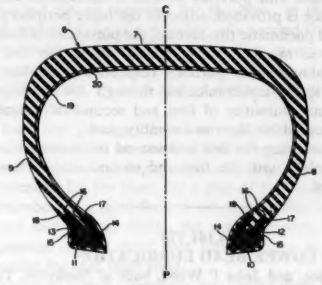


from said cross edged splitting blade, that portion of the tree block located between said cross edged splitting blade and the operator after said splitting edge has penetrated the tree block to split same to prevent that portion of the tree block from being thrown toward the operator when the tree block splits.

4,181,167
CLUB ORGANIZER FOR GOLF BAG
Leo J. Ret, 15 Latham Vill. Ln., #6, Latham, N.Y. 12110
Filed Jun. 16, 1978, Ser. No. 916,085
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 R **5 Claims**

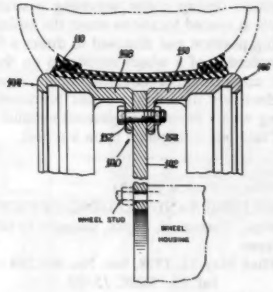
1. A club organizer for the golf bag comprising a base having plurality of openings spaced along its periphery for each receiving the end of a golf club shaft; a top having an open center; rods securing said base and said top; said top having a plurality of tabs extending inwardly toward said open center; each tab having arcuate side portions forming fixed notches between the outer periphery of said top and said open center; a club holder formed of resilient elastomeric material secured to said top; said holder formed with a plurality of resilient notches each of which is aligned with a said fixed notch between a pair of tabs for yieldingly gripping the shaft of a golf club near the head thereof.

4,181,168
PNEUMATIC TIRE
Robert E. Gordon, Toronto, Canada, assignor to Goodyear Canada, Inc., Toronto, Canada
Continuation of Ser. No. 308,912, Nov. 22, 1972, abandoned, which is a division of Ser. No. 84,672, Oct. 28, 1970, abandoned. This application Mar. 22, 1976, Ser. No. 668,890
Int. Cl.[2] B60C *15/06*
U.S. Cl. 152—362 CS **8 Claims**



1. A pneumatic tire, consisting of:
(a) a pair of spaced, annular beads;
(b) a tread and pair of sidewalls integrally extruded free of reinforcement cords and toroidally shaped between the beads; and
(c) a trap strip wrapped around each of the beads and engaging the sidewalls, the trap strips including reinforcements for holding the beads to the sidewalls.

4,181,169
RIM CONSTRUCTIONS
Charles E. Grawey, Peoria; Robert W. Untz, Hanna City, and Keith E. Koch, Tremont, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 476,100, Jun. 3, 1974, abandoned, which is a division of Ser. No. 402,268, Oct. 1, 1973, Pat. No. 3,877,504. This application Jan. 16, 1976, Ser. No. 649,616
Int. Cl.[2] B60C *5/00*
U.S. Cl. 152—404 **2 Claims**



1. A rim assembly for a pneumatic tire carcass comprising:
an annular plate;
a first annular rim portion positionable on one side of the annular plate, and on which a portion of a pneumatic tire is seatable;
a plurality of first tab members fixed to the first annular rim portion and positionable along the outer annular edge portion of the annular plate with the first annular rim portion so positioned;

a second annular rim portion positionable on the other side of the annular plate, and on which a portion of the pneumatic tire carcass is seatable;

a plurality of second tab members fixed to the second annular rim portion and positionable along the outer annular edge portion of the annular plate with the second annular rim portion so positioned;

the pluralities of first and second tab members being spaced from a pneumatic tire carcass seated on the first and second annular rim portions so that a continuous annular open space is provided, adjacent the inner periphery of a so-seated pneumatic tire carcass, the pluralities of first and second tab members being spaced about the first and second annular rim portions respectively so that said annular space communicates, through the spacing between said pluralities of first and second tab members, with space within the rim assembly; and

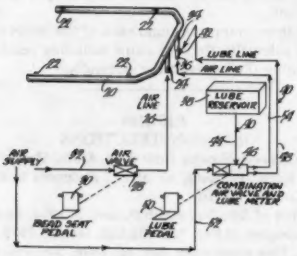
means for securing the first and second tab members to the annular plate with the first and second rim portions so positioned.

4,181,170

LOWER BEAD LUBRICATION

Joseph C. Price, and John F Wood, both of Nashville, Tenn., assignors to The Coats Company, Inc., La Vergne,, Tenn.

Filed May 25, 1978, Ser. No. 909,539
Int. Cl.[2] B60C *25/00*
U.S. Cl. 157—1.1 **9 Claims**



1. In a tire changing apparatus having a base, a table on the base for receiving a wheel and supporting the same in a wheel servicing position during a tire servicing operation, and a plurality of jets at spaced locations about the table below said wheel servicing position and disposed to direct a fluid stream toward the underside of a wheel supported on the table, the improvement comprising: a liquid lubricant reservoir, and means for selectively directing a liquid lubricant from said reservoir along with a pressurized gaseous medium through at least some of said jets to impinge upon a wheel.

4,181,171

MOLDING SAND FEEDING DEVICE

Mikio Yonemitsu, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Japan

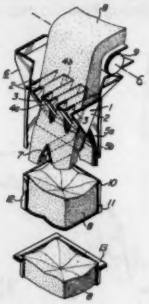
Filed May 22, 1978, Ser. No. 908,249
Int. Cl.[2] B22C *15/00*
U.S. Cl. 164—193 **3 Claims**

1. A molding sand feeding device comprising:

(a) a first molding sand distribution mechanism constructed of a plurality of partition and bottom plates for distributing the molding sand downwardly into a plurality of flows alternately directed in opposite directions,

(b) a second molding sand distribution mechanism which is disposed immediately below said first molding sand distribution mechanism and which is in the form of an inverted V, whereby the flows of the molding sand discharged from said first molding sand distribution mechanism may be divided into two downward flows in opposite directions, and

(c) a third molding sand distribution mechanism which is disposed immediately below said second molding sand



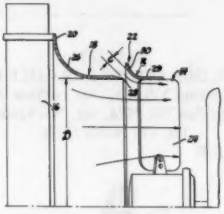
distribution mechanism at right angles thereto and which is in the form of an inverted V, whereby the flows of the molding sand discharged from said second molding sand distribution mechanism may be divided into two downward flows in opposite directions.

4,181,172

FAN SHROUD ARRANGEMENT

Richard E. Longhouse, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1977, Ser. No. 812,130
Int. Cl.[2] F28F *13/06*
U.S. Cl. 165—51 **4 Claims**



1. In combination, an air cooled radiator, a rotatable fan spaced rearwardly of said radiator and having a plurality of radially extending circumferentially spaced fan blades for inducing a primary airflow stream through said radiator, a rotatable shroud secured to the outer tips of said fan blades including an annular section for eliminating tip vortex characteristics and resultant blade tip clearance noise, said shroud further including a bell-mouthed inlet section extending forwardly from a leading edge of said annular section, said bell-mouthed inlet section having a predetermined radius of curvature and being flared radially outwardly through an arc of at least about 90 degrees and terminating in an outwardly extending circumferential surface, stationary surface means on said radiator upstream of the fan and spaced from the circumferential surface of said bell-mouthed inlet section a distance substantially less than the radius of curvature of said bell-mouthed inlet section to define a restricted recirculating air inlet between said stationary surface means and said bell-mouthed inlet section which is effective to provide for the smooth recirculating flow of air from around the rotatable shroud into the primary airflow stream, thereby substantially eliminating unsteady flow interaction characteristics between the recirculat-

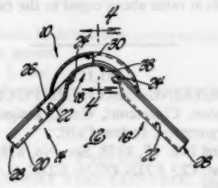
ing flow of air and blades of said rotatable fan to substantially reduce inflow noise.

4,181,173

HEAT EXCHANGER ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1978, Ser. No. 880,991
Int. Cl.² F28F 3/12; F25B 39/02
U.S. Cl. 165—169 **6 Claims**



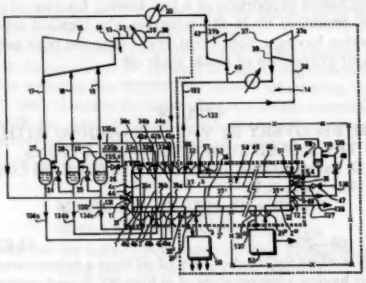
1. A heat exchanger assembly comprising; a compartment having at least two sides to define at least one corner, a first plate member for defining said sides and said corner, at least one embossment in said first plate member on each of said sides of said corner and having one end of each of said embosssments terminating in spaced relationship to said corner, said first plate member having a portion in each of said sides between said one end of said embossment therein and said corner which is coplanar with the remainder of said side of said first plate member surrounding said embossment therein, a second plate member mating with said first plate member to define fluid channel passages for receiving a heat exchange fluid, an embossment in said second plate member extending about the outside of said corner and overlapping a portion of said ends of said first-mentioned embossments to interconnect said first-mentioned embossments, and connecting means for attaching said plate members together.

4,181,174

HEAT EXCHANGERS

Maurice Grenier, Paris, France, assignor to L'air Liquide, Societe Anonyme pour l'etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 10, 1978, Ser. No. 885,112
Claims priority, application France, Mar. 16, 1977, 77 07777
Int. Cl.² F28F 21/00
U.S. Cl. 165—180 **18 Claims**



1. In a thermal exchange assembly including at least one thermal exchange member of the plate heat-exchanger kind comprising a plurality of metal plates of substantially identical outline which extend in a first dimension, or length, and a second dimension, or width, and which are spaced apart from and arranged parallel to one another in a third dimension, or thickness, and sealing means which, in conjuction with the plates, define a plurality of flattened passages, forming:

at least one passage of a first type, belonging to a first circuit intended for the flow, for the whole length of the said member, of a first fluid the sealing means allotted to a passage of said first type leaving open, at the two ends of the latter, an inlet and an outlet respectively for said first fluid,

and/or at least one passage of a second type, belonging to a second circuit intended for the flow, in the lengthwise direction of the said member, of a second fluid in co-current with said first fluid, the sealing means allotted to a passage of said second type leaving open, at the two ends of the latter, an inlet and an outlet respectively for said second fluid,

at least one passage of a third type in thermal exchange relation with at least one of the two passages of said first and said second types and belonging to a third circuit intended for the flow, for a part of the length of the said member, of a third fluid in counter-current with said first and said second fluids, the sealing means allotted to a passage of said third type leaving open an inlet and an outlet for said third fluid,

the invention which comprises the combination of the following features:

(a) said thermal exchange member includes at least one passage of a fourth type in thermal exchange relation with at least one of the two passages of said first and second types and belonging to a fourth circuit instead to receive a fourth fluid, the sealing means allotted to a said passage of the fourth type leaving open, at the two ends of the latter, a first opening and a second opening respectively reserved for the said fourth fluid,

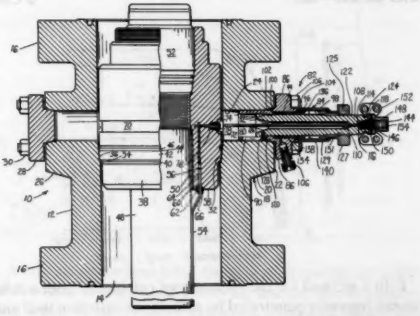
(b) at least one passage of said fourth type adjacent a passage of said third type extends for another part of the length of the said member; and at least one transverse partition which extends for the width of the said member separates the two passages of said third and said fourth types from one another.

4,181,175

CONTROL LINE EXITING COUPLING

John K. McGee; Charles D. Bridges, both of Houston, Tex., and Robert T. Brown, Glasgow, Scotland, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 27, 1978, Ser. No. 946,137
Int. Cl.² E21B 33/03
U.S. Cl. 166—85 **7 Claims**



7. Apparatus for connecting a laterally outwardly opening control fluid passageway in a well pipe hanger with a side outlet passageway in a well pipe head in the vertical bore of which the well pipe hanger is suspended, with provision being made for withdrawing the connection radially outwards across

the surface between the hanger and the head, said apparatus comprising:

first constrictable frictionally gripping means mounted in the control fluid passageway;

a length of flexible tubing having an inner end portion inserted in said control fluid passageway, said tubing length inner end portion being frictionally gripped and held in sealed relation therein by constriction thereabout of said first constrictable frictionally gripping means;

a tubular sleeve telescopically non-rotatively slidably received in said side outlet passageway with annular sealing means being provided between said tubular sleeve and said side outlet passageway, said tubular sleeve having a longitudinal bore;

said tubing length having an outer end portion inserted in said tubular sleeve longitudinal bore, said tubing length outer end portion being frictionally gripped and held in sealed relation therein by constriction thereabout of said second constrictable frictionally gripping means;

said second constrictable frictionally gripping means further including stop means for preventing axial withdrawal of said tubing length outer end portion therethrough;

a tubular nut having differential internal and external threading thereon, said tubular nut being coaxially received radially between said side outlet passageway and said tubular sleeve and in threaded engagement with both, said tubular nut having a wrenching land means accessable for wrenched rotation from externally of said head;

whereby:

(a) a sealed connection may be made across said interface even when the control fluid passageway is misaligned with respect to the side outlet passageway, due to the flexibility of said tubing length,

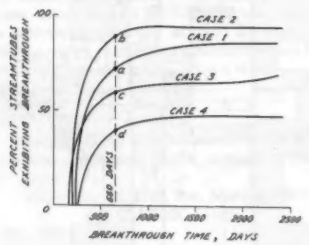
(b) said tubing length need not be precut to an exact length, due to the flexibility thereof and due to the possibility of permitting more or less of at least one said end portion thereof to project past the respective constrictable frictionally gripping means to accommodate field conditions; and

(c) said tubing length may be non-rotatively withdrawn radially outwards of said head across said interface by wrenching upon said tubular nut.

4,181,176
OIL RECOVERY PREDICTION TECHNIQUE

Gregory D. Frazier, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,312
Int. Cl.[2] E21B *43/22, 47/10*
U.S. Cl. 166—252 **8 Claims**



1. In a method for the recovery of petroleum from a subterranean reservoir penetrated by at least one injection well and at least one production well, said wells being in fluid communication with each other through the reservoir,which comprises injecting an oil displacing fluid into the reservoir via the injection well to pass through the reservoir along a plurality of streamtubes, displacing the petroleum toward the production well and recovering petroleum from the production well, a technique for increasing the recovery efficiency of the method which comprises:

a. determining the number of streamtubes which breakthrough at the production well within a preselected period of time for a plurality of fluid injection and production rates;

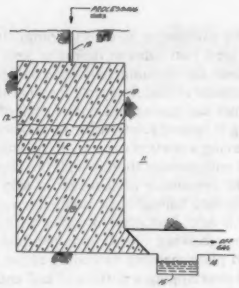
b. identifying the fluid injection and production rates at which the number of streamtubes intersecting the production well is at least equal to a predetermined percentage of the total number of streamtubes; and

c. injecting the oil displacing fluid and extracting the produced fluids at rates about equal to the rates determined in step b.

4,181,177
CONTROLLING SHALE OIL POUR POINT

Leslie E. Compton, Claremont, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Feb. 17, 1978, Ser. No. 878,668
Int. Cl.[2] E21B *43/24;* E21C *41/10*
U.S. Cl. 166—256 **40 Claims**



10. A method for lowering the pour point of shale oil produced by in situ retorting which comprises:

separating a low boiling fraction from a first portion of shale oil produced by in situ retorting to produce a modified shale oil having a higher pour point than the pour point of the first portion of shale oil; and

blending a sufficient proportion of such low boiling fraction with a second portion of shale oil produced by in situ retorting to produce a blended shale oil composition having a pour point lower than the pour point of the second portion of shale oil.

28. A blended shale oil composition comprising a major proportion of crude shale oil produced by in situ retorting and an added minor proportion of a low boiling fraction of crude shale oil produced by in situ retorting, the blended shale oil composition having a pour point lower than the pour point of said major proportion of crude shale oil.

4,181,178
OIL RECOVERY BY WATERFLOODING WITH THICKENED SURFACTANT SOLUTIONS

Joseph G. Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,626
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **13 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir having a temperature of at least 90° F. and penetrated by spaced injection and production systems wherein an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising:

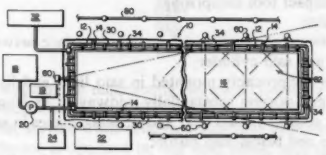
employing as at least a portion of the fluid introduced into said injection system an aqueous solution of a surfactant

having a viscosity less than that of the reservoir oil and thereafter a thickened aqueous liquid having a salinity within the range of 5–18 weight percent and containing a water-soluble sulfonated polyethoxylated aliphatic alcohol which increases the viscosity of said aqueous liquid to a value equal to or greater than the viscosity of the reservoir oil, said sulfonated polyethoxylated aliphatic alcohol having an HLB within the range of 10.0–14.0 and being characterized by the formula:

$$R(OC_2H_4)_nOC_3H_6SO_3^-M^+$$

wherein
R is an aliphatic hydrocarbon group containing from 16 to 20 carbon atoms,
n is at least 2, and
M is an alkali metal, ammonium, or substituted ammonium ion.

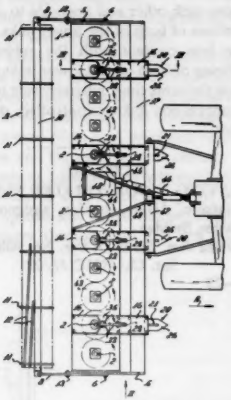
4,181,179
AIRPORT RUNWAY FIRE CONTROL METHOD AND APPARATUS
Christopher L. Batte, 7816 Purdue, Dallas, Tex. 75225
Filed Mar. 13, 1978, Ser. No. 885,534
Int. Cl.[2] A62C *37/04*
U.S. Cl. 169—47 **12 Claims**



1. An airport fire control system for combating combustion in the vicinity of an airport runway, said system comprising:
a network of tubing containing a fire suppressant substance and disposed about said airport runway;
means for pressurizing said fire suppressant substance within said tubing and causing said fire suppressant substance to egress under relatively constant pressure;
discharge means spaced along said tubing and interconnected therewith for discharging fire suppressant material therefrom;
angulation means coupled to said discharge means controlling the orientation of said discharge means for selectively ejecting fire suppressant in a predefined pattern;
control means for regulating the actuation of said network of tubing;
detector means interconnected with said control means for sensing a select event requiring the discharge of fire suppressant from said discharge means;
said detector means including a heat sensor coupled to said discharge means for causing the select angulation thereof for spraying fire suppressant upon a select area; and
said control means including detector means coupled therewith for establishing a select glide path spectrum and receiving a response therefrom relative to aircraft approaching said airstrip.

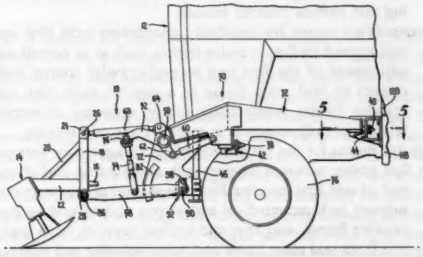
4,181,180
SOIL CULTIVATING MACHINES
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland
Filed Jun. 15, 1977, Ser. No. 806,671
Claims priority, application Netherlands, Jun. 18, 1976, 7606606
Int. Cl.[2] A01B *49/02*
U.S. Cl. 172—50 **14 Claims**

14. A soil cultivating machine comprising an elongated frame and soil working means supported on said frame, coupling means on said frame positioned for connection to a prime mover, said soil working means including a transverse row of cultivating tools positioned to penetrate the ground, each of said tools comprising a subsoil working element pivoted adjacent the lower end of the tool and driving means connected to periodically turn said elements about their pivots and raise subsoil upwardly to a limited extent from below the surface of the ground, a row of tined rotors on respective upwardly



extending shafts being positioned to work the top soil at a level above said elements, said cultivating tools being positioned in front of said row, driving means including rotary gears on said shafts and an eccentric being mounted on some of the shafts, said eccentric being linked to a respective element by means of a drive connection located at the rear of said tool with respect to the direction of travel of said implement, said gears being driven to turn the rotors and work the top soil.

4,181,181
TRACTOR IMPLEMENT HITCH WITH RUBBING SURFACES TO LIMIT SWAY
John L. Old, Kenilworth, England, assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed Nov. 21, 1977, Ser. No. 853,783
Int. Cl.[2] A01B *59/041, 59/048*
U.S. Cl. 172—443 **8 Claims**



2. A tractor implement hitch capable of mounting an implement forward of a forwardly moving tractor, the implement having a pair of transversely extending hitch pins which may be spaced apart varying distances; the tractor implement hitch being characterized by:
a pair of laterally spaced apart forwardly extending lower compression links, the forward ends of which may be moved vertically and which may also swing from side to side,

a pair of generally vertical extending rubbing surfaces associated with the tractor for abutment with an intermediate portion of the lower links to limit the sway of the lower links; and

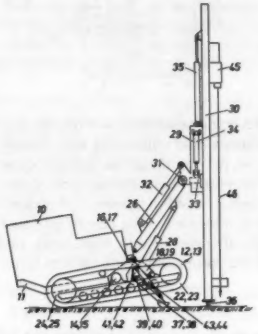
a pair of laterally spaced apart mounting means associated with the tractor for mounting the rear end of the lower links, the mounting means being capable of infinitely adjusting the rear ends of the lower links towards and away from each other and operable to cause the intermediate portions of both of the lower links to be constrained to move into contact with the rubbing surfaces, the contact being of both of said lower links with said rubbing surfaces at the same time, whereby side to side sway of the lower compression links is controlled, thus stabilizing the implement.

4,181,182

WAGON HAVING INCORPORATED SUPPORT JACKS

Sven H. Gustafsson, Alvsjo, Sweden, assignor to Atlas Copco AB, Stockholm, Sweden

Filed Jun. 21, 1977, Ser. No. 800,563
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—23 **18 Claims**



1. A wagon having a main frame for carrying a drilling assembly, said wagon being supported by oscillable first and second endless crawler frames disposed one on each side of said main frame;

said first and said second frames each having at least a front rotary member and a rear rotary member for the propulsion of said wagon by means of said rotary members driving said endless crawler frames;

connecting means for oscillably connecting said first and said second endless crawler frames such as to permit self adjustment of the first and second crawler frames with respect to said main frame in a manner such that said crawler frames substantially follow contours of terrain when said drill wagon is in motion over said terrain;

motor means for the propulsion of said wagon over terrain;

a first power actuated support jack mounted on and at one end of said first crawler frame; a second power actuated support jack mounted on and at one end of said second crawler frame, said first and second support jacks being free from said main frame and being actuable and adapted to act upon said first and second crawler frames to take support against the terrain adjacent said crawler frames for raising one end of said first and said second crawler frames above said terrain;

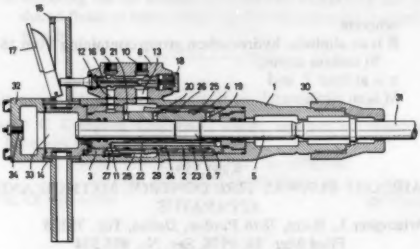
said first and second jacks being supported from and disposed on said first and second frames and adapted to form a stable four-point support arrangement comprising said first and said second jacks and the other ends of said first and said second crawler frames, remaining on said terrain for supporting said wagon stably.

4,181,183

IMPACT TOOL

Hiroshi Okada, Suita, Japan, assignor to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Filed Jan. 5, 1978, Ser. No. 867,174
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—119 **2 Claims**



1. An impact tool comprising:

a cylinder;

a liner mounted therein with an annular space between said liner and said cylinder;

a piston reciprocably mounted in said liner and having an enlarged portion substantially midway of its length sealingly slidable in said liner and defining spaces in said liner above and below said piston;

a tool holder secured to the bottom of said cylinder for holding therein a tool to be hit by said piston upon the downward stroke of said piston;

said liner having a plurality of oil apertures therein between the interior of said liner and said annular space and spaced along the length of said liner for flow of hydraulic oil between said annular space and the spaces in said liner above and below said enlarged portion of said piston, and said cylinder having an outlet opening out of said annular space;

a tubular valve slidably mounted on said liner in said annular space for controlling the flow of hydraulic oil through said oil apertures into the space below said enlarged portion for pushing the piston up when said valve is in a lower position and for allowing the oil in said lastmentioned space to be discharged from the lastmentioned space when said valve is in an upper position and having a portion with an effective cross-sectional area exposed to hydraulic oil under pressure through one of said oil apertures when said piston is in the raised position for raising said tubular valve, said portion no longer being exposed to the hydraulic oil under pressure when said enlarged portion of said piston passes said one oil aperture on its downstroke;

at least one rod slidably mounted on the cylinder for movement substantially parallel to said piston and extending into said annular space and having one end engaging said tubular valve;

a gas reservoir provided above the cylinder for containing gas for being compressed as said piston moves up; and

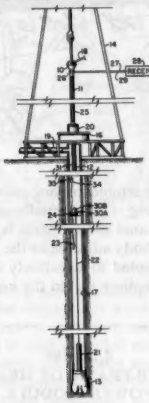
a hydraulic circuit in said cylinder and said liner for supplying hydraulic oil said liner for flow through said oil apertures and to the other end of said rod against an effective cross-sectional area of said rod which is less than said effective cross-sectional area of said portion of tubular valve member for biasing said rod and said tubular valve down under hydraulic pressure when the tubular valve is in the upper position.

4,181,184

SOFT-WIRE CONDUCTOR WELLBORE TELEMETRY SYSTEM AND METHOD

Serge A. Scherbatskoy, Ft. Worth, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,835
Int. Cl.[2] E21B *47/12*
U.S. Cl. 175—65 **14 Claims**



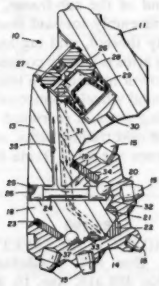
13. In a system for maintaining electrical continuity between a subsurface location in a drill string and a location substantially at the surface while drilling, wherein an insulated electrical conductor is disposed in said drill string, said conductor having a looped portion to provide storage of excess conductor in said drill string, the improvement wherein said looped portion is random and free-hanging within said drill string without tensioning means and is composed of a resilient flexibly-insulated conductor having a conducting inner core and a resilient, insulating outer sheath.

4,181,185

THRUST FLANGE ACTUATED ROCK BIT LUBRICATION SYSTEM

Wilbur S. Keller, Arlington, and William D. Vanderford, Irving, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 5, 1978, Ser. No. 939,312
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—229 **1 Claim**



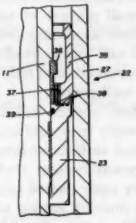
1. An earth boring bit, comprising:
a bit body;
a bearing pin extending from said bit body;
a rotatable cutter mounted upon said bearing pin;
bearing and seal means between said bearing pin and said cutter;
a thrust flange on said bearing pin;
a thrust flange in said rotatable cutter positioned opposite said thrust flange on said bearing pin;
a lubricant reservoir in said bit body;
lubricant in said lubricant reservoir;
first passage means for channeling lubricant from said lubricant reservoir to said bearing means;
second passage means for channeling lubricant from said bearing means to said lubricant reservoir; and
a series of grooves extending across said thrust flange in said rotatable cutter for pumping said lubricant through said first passage means from said lubricant reservoir to said bearing means and through second passage means from said bearing means back to said lubricant reservoir, said series of grooves in said thrust flange of said rotatable cutter acting against said thrust flange of said bearing pin to pump lubricant through said first and second passage means.

4,181,186

SLEEVE VALVE HYDRAULIC JAR TOOL

James R. Blanton, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 5, 1978, Ser. No. 939,563
Int. Cl.[2] E21B *1/10*
U.S. Cl. 175—297 **3 Claims**



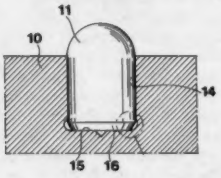
1. A method of changing the detent action of a hydraulic jarring tool to decrease the detent action or to increase the detent action, said hydraulic jarring tool having an outer member and an inner member telescopically arranged with spline means between said outer member and said inner member for transmitting torque, an anvil and hammer means for providing a jarring effect, first seal means between said outer member and said inner member for providing a fluid seal, second seal means between said outer member and said inner member for providing a fluid seal, a working fluid chamber between said first seal means and said second seal means and between said inner member and said outer member, a working fluid contained in said working fluid chamber, and sleeve valve means in said working fluid chamber for metering said working fluid, said sleeve valve means including a valve body with a surface, a stop member with a surface, and a groove system between said valve body surface and said stop member surface that provides a tortuous flow path for metering said working fluid and producing said detent action, comprising the steps of:
deepening said groove system to decrease the detent action or grinding the surface containing said groove system to increase the detent action.

4,181,187

ROCK DRILL BIT WITH STRESS RELIEF INSERT SOCKETS

Karl L. G. Lumen, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 24, 1978, Ser. No. 880,993
Claims priority, application Sweden, Mar. 3, 1977, 7702345
Int. Cl.[2] E21C *13/00, 13/08*
U.S. Cl. 175—410 **3 Claims**



1. A rock drill bit comprising:

a steel body including a front peripheral surface, said surface having a plurality of holes extending longitudinally inwardly from said surface, said holes each including:

a steel cylindrical wall portion,

a steel bottom wall portion defining the longitudinally inner end of said hole,

a radially enlarged steel transition wall portion extending between a longitudinally inner end of said cylindrical wall portion and a radially outward end of said bottom wall portion,

a plurality of hard metal inserts mounted in said holes and projecting outwardly of said surface, said inserts each including a side surface comprising:

a cylindrical surface portion directly abutting against said cylindrical wall portion of said hole, said cylindrical surface portion extending longitudinally inwardly at least as far as said longitudinally inner end of said cylindrical wall portion of said hole and terminating short of said bottom wall portion,

a tapered surface portion extending longitudinally and radially inwardly from said longitudinally inner end of said cylindrical surface portion, and

a radially disposed bottom surface portion defining a longitudinally inner end of said insert said bottom surface portion abutting against said bottom wall portion,

said transition wall portion of said hole extending from said longitudinally inner end of said cylindrical wall portion in a longitudinally inward and radially outward direction and later extending longitudinally inwardly and radially inwardly and finally adjoining said bottom wall portion, and having a configuration whose concave portions are smoothly curved to eliminate abrupt concave corners liable to cause localized stress concentrations in the wall of the hole and subsequent fatigue failure therein.

4,181,188

ENERGY EFFICIENT PASSENGER VEHICLE

Richard Dessert, 2016 Euclid #1, Santa Monica, Calif. 90405

Filed Aug. 28, 1978, Ser. No. 937,503
Int. Cl.[2] B60L *11/18*
U.S. Cl. 180—2 A **6 Claims**

1. An energy efficient electrically powered vehicle which comprises:

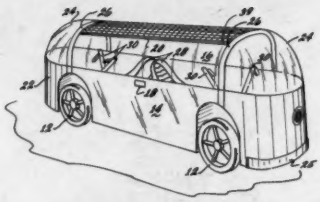
an elongated substantially closed body having two spaced supporting wheels at each end;

a power module at each end of said body comprising electrical batteries and electrical drive means adapted to power said wheels;

an elongated solar panel substantially covered with photovoltaic cells located in the roof of said body adapted to generate electricity to charge said batteries;

means to pivot said solar panel about substantially the panel longitudinal centerline so that said panel may be oriented towards the sun;

flexible duct means attached to the longitudinal edges of said



panel, extending around rollers overlapping the sides of said body, forming a substantially uniform volume duct parallel to said panel as said panel is pivoted;

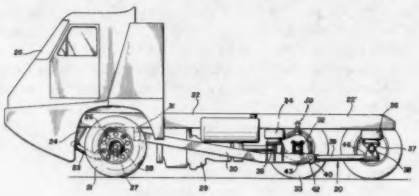
vent means in said body adjacent to the forward and aft ends of said panel adapted to selectively connect said duct to the outside atmosphere and to the interior volume of said vehicle.

4,181,189

TAG AXLE FOR SUB-FRAME OF HEAVY DUTY TRUCK POWER MODULE

Dean Hobbensiefken, Rte. 1, Box 39, Lyons, Oreg. 97358

Filed Jul. 31, 1978, Ser. No. 929,798
Int. Cl.[2] B60K *5/00;* **B62D** *61/10*
U.S. Cl. 180—11 **10 Claims**



1. In a truck, a rearwardly extending main frame having a front steerable unit, a separable power module including a sub-frame and a rear power axle having traction wheels underlying the main frame with the sub-frame of the power module coupled in trailing relationship to the front steerable unit, spring means interposed between said main frame and sub-frame near the rear end of the sub-frame, the improvement comprising a tag axle assembly for said truck to increase the load carrying capability thereof, said tag axle assembly comprising a pair of trailing arms pivotally connected to the rear of said sub-frame of the power module on a transverse pivot axis, a tag axle including ground wheels connected with and extending between said trailing arms, a rearward extension of said truck main frame above said trailing arms, and another spring means interposed between the main frame extension and said tag axle assembly.

4,181,190

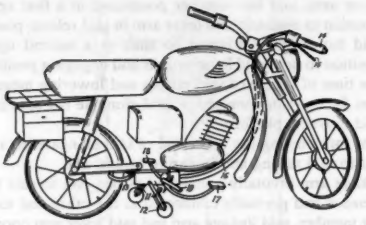
MOTORCYCLE AND BICYCLE SAFETY CONTROLS

Yin-Lung Yang, P.O. Box 865, Kaohsiung, Taiwan 800,

Continuation of Ser. No. 458,411, Apr. 10, 1974, abandoned. This application Sep. 19, 1975, Ser. No. 614,862
Int. Cl.[2] B62H *1/00*
U.S. Cl. 180—219 **9 Claims**

1. A safety control assembly for a tandem wheeled vehicle, said vehicle usually having an engine for driving at least one of

said wheels, an ignition switch for said engine, a throttle for said engine, a warning horn, a pair of auxiliary support legs movable from a retracted position to an extended position at opposite lateral sides of said vehicle, and means for braking at least one of said wheels, said control assembly comprising: a mechanism box mounted underneath said vehicle, a hand operational means mounted on said vehicle, a foot operational means mounted on said vehicle, said mechanism box embodying a series of operational mechanisms, each of said operational means being movable through a plurality of sequential positions, means for actuating said operational means through said sequential positions for sequentially moving said throttle in a speed decreasing direction, actuating said horn, moving said auxilary support legs to said extended position, and actuating said braking means, respectively, and means for locking said control assembly in the respective position in which said ignition switch is off and said operational means are locked, said responsive movements are reversible after said locking means are unlocked, said assembly also being adapted for use on a non-motorized tandem wheel vehicle with the throttle control and ignition switch omitted or disconnected.



4,181,191

PNEUMATIC SYSTEM FOR A CENTRAL LOCKING SYSTEM FOR MOTOR VEHICLES ACTUATED BY A FLOWING MEDIUM

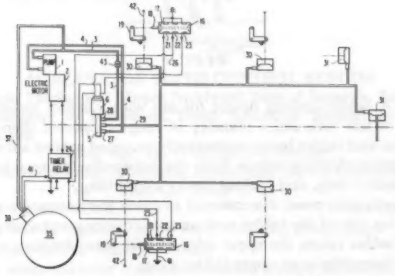
Rüdiger Hoffmann, Sindelfingen; Dieter Feichtiger, Aidlingen; Theodor Reinhard, Böblingen; Ernst Haug, Sindelfingen; Bernhard Schulze, Ehningen, and Emil Bleibtreu, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1978, Ser. No. 893,529

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715136

Int. Cl.[2] E05B *65/38*

U.S. Cl. 180—289 **11 Claims**



1. A pneumatic system for a central locking installation actuated by a fluid medium for motor vehicles, the pneumatic system comprising a locking mechanism provided at least at one of two doors of the motor vehicle, and line means for conducting pressures to pneumatic elements each of which is associated with a respective part to be locked, the pneumatic elements being operable to selectively open and close the associated part during a key actuation of the locking mechanism, characterized in that a respective pneumatic element serving for the opening and closing of an associated part is constructed as a single chamber means to which excess pressure and vacuum are alternately conducted by way of the same line means, a pump means driven by a motor means is provided for producing said excess pressure and vacuum, a pulse transmitter means is operatively connected with said motor means so as to set said motor means into operation upon an actuation of the locking mechanism of the at least one door, and means are provided for automatically turning off the motor means after termination of an opening and closing operation, said means for automatically turning off the motor means includes a timer means operably connected to the pulse transmitter means and the motor means a solenoid valve means is provided for enabling a selective entry of excess pressure or vacuum into the line means for conducting pressures to the pneumatic elements for closing or opening the respective parts to be locked associated therewith, said timer means establishes a contact with said solenoid valve means so as to cause selective activation thereof.

4,181,192

ENGINE MOUNTING

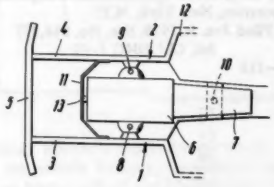
Hermann Danckert, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Division of Ser. No. 654,055, Jan. 30, 1976, Pat. No. 4,073,357. This application Sep. 26, 1977, Ser. No. 836,501

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1975, 2506303

Int. Cl.[2] B60R *21/02*; B60K *5/00*

U.S. Cl. 180—232 **2 Claims**



1. A motor vehicle comprising:

a chassis having frontal energy absorbing members;

an engine unit;

vibration dampening, releasable mounts for attaching said engine unit to said chassis behind said energy absorbing members;

and a tension strap behind said energy absorbing members connected to said chassis and arranged to exert restraining force on said engine unit to prevent engine unit motion in a forward direction with respect to said chassis, only after release of said mounts and commencement of motion of said engine unit relative to said chassis in the direction of vehicle travel, thereby restraining the forward motion of said engine unit with respect to said chassis on the occurence of a frontal collision.

4,181,193

SOUND PROJECTION SYSTEM

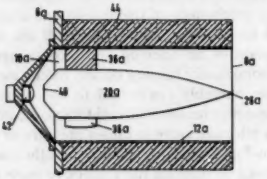
Timothy P. Isaac, 2, Priory Rd., Needingworth, Huntingdon, Cambridgeshire, England

Filed Sep. 16, 1977, Ser. No. 833,873

Claims priority, application United Kingdom, Sep. 23, 1976, 39603/76

Int. Cl.[2] **G10K** *11/00, 13/00*

U.S. Cl. 181—185 **7 Claims**



1. A sound projection system comprising a housing having a means defining a longitudinally extending acoustic channel, said channel having an acoustically opened front end and an acoustically closed rear end and acoustically closed sides; a loudspeaker carried at the rear of said housing, said loudspeaker having a cone diaphragm defining a part frusto-conical volume and operating into the channel at the rear end of the channel; and a longitudinally extending member mounted within the channel directly in front of, and in alignment with, the loudspeaker to restrict the free space within the channel, said member having a front portion, which is tapered towards the front of said channel, and a rear portion, which is tapered abruptly towards said loudspeaker and projects into said part frusto-conical volume, terminating with a flat end facing the loudspeaker, said member being supported by a strut fixedly attached at one end to the inner wall of said housing extending radially inward and attached fixedly to said member at the other end.

4,181,194

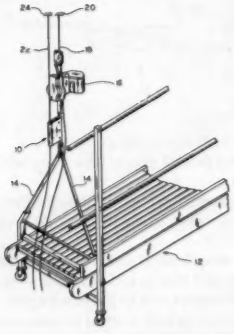
SAFETY CLAMP DEVICE AND APPARATUS UTILIZING SAME

James H. Bassett, Redwing, Minn., and Paul L. King, Stockholm, Wis., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 9, 1978, Ser. No. 914,277

Int. Cl.[2] **E04G** *3/10*

U.S. Cl. 182—112 **20 Claims**



1. A safety clamp device adapted to be slidably mounted on an upright safety cable and adapted to be connected to a means for raising and lowering a movable platform, said safety device comprising:

a body member having a cable receiving cradle adapted to receive said safety cable;

a lever arm shiftably mounted on said body member for movement about an axis transverse to the slidable movement of said body member relative to said safety cable, said lever arm shiftable between a safety cable engaging position and a safety cable release position;

safety cable engaging means for engaging said safety cable when said lever arm is in said engaging position;

at least one elongate bar member pivotally attached to said lever arm, said bar member positioned in a first upright position to maintain said lever arm in said release position, said bar member adapted to shift to a second upright position to urge said lever arm to said engaging position at the time of failure of said raising and lowering means;

means for coupling one end of said elongate bar member to said movable platform;

means for coupling the other end of said elongate bar member to said raising and lowering means; and

a linkage arm pivotally connected at one end to said body member and pivotally connected at the other end to said bar member, said linkage arm and said lever arm cooperatively acting to maintain said cradle and said bar member in parallel relationship to said safety cable.

4,181,195

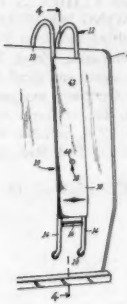
LADDER LOCK

Clifford R. Clarke, 2782 Elysium, Eugene, Oreg. 97401

Filed Feb. 13, 1978, Ser. No. 877,172

Int. Cl.[2] **E06C** *5/32, 7/00*

U.S. Cl. 182—230 **3 Claims**



1. A ladder locking device for use with a ladder having a pair of side rails and a plurality of rungs supported therebetween, said ladder being permanently mounted against a frame to permit climbing access from the outwardly-facing side of the ladder only, said locking device comprising,

an elongate panel dimensioned to cover the outwardly-facing side of the ladder over an area covering a plurality of ladder rungs, the upper edge of said panel forming a lip fastenable to an upper ladder rung,

a lock mounted on a lower portion of said panel,

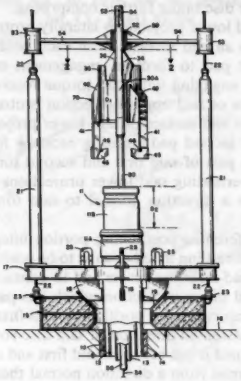
means for selectively positioning said lock on said panel to produce a desired spacing between said lock and said lip, and

a locking arm attached to said lock, selectively positionable between locking and unlocking positions, wherein said locking arm engages and disengages, respectively, a lower ladder rung.

4,181,196
METHOD AND APPARATUS FOR RECOVERY OF SUBSEA WELL EQUIPMENT

Lacy B. Darby, Houma, and Joseph A. Holley, Gretna, both of La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jun. 23, 1977, Ser. No. 809,337
Int. Cl.² E21B *7/12, 43/01*
U.S. Cl. 166—361 **9 Claims**



1. Apparatus for recovering a subsea guide base and wellhead attached to well pipe suspended in a subsea borehole comprising:

(a) a tubular member extending from above said wellhead into said well pipe;

(b) an explosive arranged in said tubular member;

(c) a frame secured to said tubular member above said explosive and positioned on said wellhead;

(d) a plurality of angularly spaced apart legs secured to said frame;

(e) a foot member connected to each of said legs;

(f) a plurality of angularly spaced apart catches attached to said wellhead, said catches and said foot members being engageable; and

(g) said foot members being positioned on said tubular member relative to the location of said catches and the location of said explosive in said tubular member such that said foot members and said catches are aligned and level with said foot members.

4,181,197
AC ELEVATOR SPEED CONTROL SYSTEM

Tomio Tanabe, and Muneo Nishiwaki, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1978, Ser. No. 895,463
Claims priority, application Japan, Apr. 15, 1977, 52-43890
Int. Cl.² H02P *1/40*
U.S. Cl. 187—29 R **12 Claims**

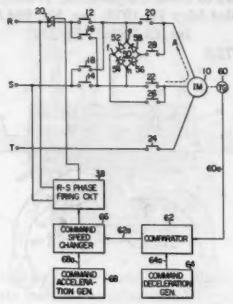
1. An AC elevator speed control system comprising:

a multiphase induction motor;

a semiconductor controlled rectifier circuit for connection to a first phase of a multiphase AC power source for controlling an alternating current;

a full wave rectifier circuit composed of semiconductor rectifier elements arranged in a bridge connected to said semiconductor controlled rectifier circuit for converting said controlled alternating current to a direct current; and

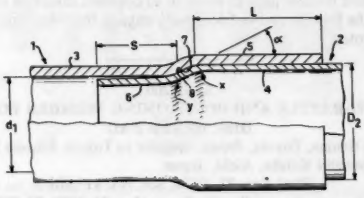
a control means connected to said semiconductor controlled rectifier circuit and said rectifier circuit for supplying said controlled alternating current to said induction motor during acceleration of said induction motor and for supplying said direct current to said induction motor during deceleration of said induction motor.



4,181,198
ENERGY ABSORBER, ESPECIALLY FOR MOTOR VEHICLES

Torsten G. Lindberg, Öckerö, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Jun. 13, 1978, Ser. No. 915,293
Claims priority, application Sweden, Jun. 16, 1977, 7706986
Int. Cl.² F16D *7/00*; B60R *19/06*
U.S. Cl. 188—1 C **11 Claims**



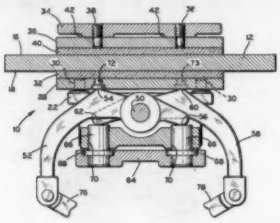
1. An energy absorber, especially for motor vehicles for supporting the vehicle bumper, for example, said absorber comprising at least a pair of tubular members (1,2) having a common centre axis and arranged to be telescopically displaced, at least a portion (3) of the length of the outer member (1) having a smaller inner diameter (d_1) than the outer diameter (D_2) of at least a portion (4) of the inner member, said outer member having an inner bevelled surface (7) while the inner member has an outer bevelled surface (8) facing said inner bevelled surface so that telescopic displacement of the members causes deformation of at least one member in the area of said bevelled surfaces, characterized in that the two tubular members (1,2) are designed so that deformation substantially takes place by means of shrinkage of the inner member (2) while two successive closely spaced bending zones (x,y) which face each other are formed in the material in the inner member, and in that the outer member (1) has an end portion (5;11) whose inner diameter is equal to the outer diameter (D_2) of the inner member, the length (L) of said end portion being at least equal to the inner diameter (D_2) of said outer member.

4,181,199

CALIPER TYPE DISC BRAKE

Richard A. Flotow, Fort Wayne, and Hans Stiel, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed May 11, 1978, Ser. No. 904,817
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—72.9 **5 Claims**



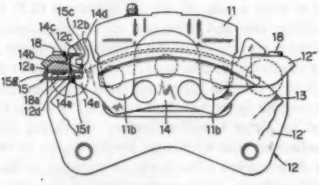
1. In a mechanical caliper type disc brake system having a rotatable rotor wherein the improvement comprises:
- a pair of friction pads disposed on opposite sides of the rotor, each of said pads provided with backing plates;
- caliper means providing support for at least one of said friction pads;
- a stationary brake shoe slidably supporting the other of said friction pads;
- a slidable connection between said caliper means and said stationary brake shoe;
- lever means having spaced apart action and reaction lobe portions; and
- pivot means for pivotally supporting said lever means at a location between the action and the reaction lobe portions whereby when said lever means is moved about said pivot means the action lobe portion thereof urges one of said friction pads to move in one direction to frictionally engage one side of the rotor and simultaneously the reaction lobe portion thereof urges said caliper and the other of said friction pads to move in an opposite direction causing the friction pad to frictionally engage the other side of the rotor.

4,181,200

ANTI-RATTLE AND POSITIONING MEMBER FOR A DISC BRAKE PAD

Teruo Souma, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 22, 1978, Ser. No. 917,801
Claims priority, application Japan, Jan. 31, 1978, 53-10329[U]
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.5 **10 Claims**



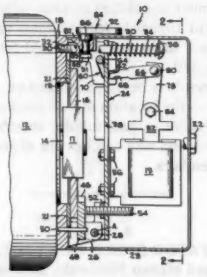
1. In a disc brake for a vehicle including:
- a disc rotor rotatable around a disc axis;
- a fixed member with a first and a second torque receiving arms extending parallel to said disc axis;
- first and second brake pads each having a friction surface substantially normal to said disc axis and mounted on said fixed member in a confronted position to each other and having said disc rotor placed there between wherein at least said first brake pad is supported by said torque receiving arms;
- at least one anti-rattling member, disposed between said first brake pad and said first torque receiving arm, for preventing the rattling of said first brake pad by biasing said first brake pad with the elasticity of said anti-rattling member in a direction parallel to the friction surface of said first brake pad; and
- an urging mechanism, retained by said fixed member, for urging said first and second brake pads onto said disc rotor, said disc brake further comprising:
- (a) upper and lower projections laterally protruding, each of which has an end surface, from each lateral end of said first brake pad to form an engagement recess therebetween for engaging with said torque receiving arms, the end surface of said upper projection protruding laterally beyond the end surface of said lower projection;
- (b) first and second pad-inserting recesses formed respectively in a part of said first and second torque receiving arms for permitting said lower projections to pass therethrough in a direction normal to said torque receiving arms; and
- (c) a circumferential positioning portion integrally formed on said anti-rattling member so as to be positioned beneath said first pad-inserting recess and to contact the end surface of said lower projection which has passed said first pad-inserting recess for positioning said first brake pad in the circumferential direction of said disc rotor when said first brake pad is put between said first and second torque receiving arms from a direction normal thereto.

4,181,201

SPRING ACTUATED, SOLENOID RELEASED BRAKE MECHANISM

Richard H. McCarthy, Greenfield, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed May 24, 1978, Ser. No. 909,314
Int. Cl.[2] B60T *13/04*
U.S. Cl. 188—171 **10 Claims**



1. A brake for selectively stopping and permitting rotation of a shaft journaled in a frame, comprising: a brake disc secured to said shaft for rotation therewith, means defining an end plate secured to said frame on one side of said disc and having a disc engaging braking surface, means defining a non-rotatable brake shoe on the other side of said disc mounted for movement toward and away from said disc, a lever pivoted to said end plate at a point radially outward of said disc, abutment means carried by said lever adjacent said pivot point in position to engage said shoe, anchor means secured to said frame, resilient means anchored to said frame by said anchor means for engaging and pivotally urging said lever in one direction, cam means pivoted to said end plate and engaging said lever, and a solenoid carried by said lever and operatively connected to said cam means pivoting the lever in the opposite direction, said points of engagement of said resilient means and said cam

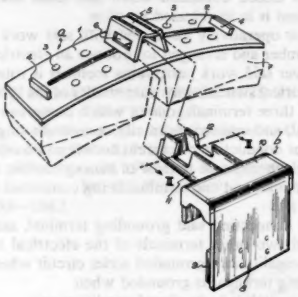
means being radially outward of said disc and diametrically opposite said pivot point, said resilient means being disposed between said lever and said anchoring means, said anchoring means being adjustable to vary the braking torque applied to the lever.

4,181,202

RAILWAY BRAKE SHOE WITH REMOVABLE FLANGE

Aaron Trajtenberg, and Ana M. Ghibaudi, both of Sarmiento 552, piso 12°, Buenos Aires, Argentina

Filed Apr. 10, 1978, Ser. No. 895,058
Int. Cl.² F16D *69/04*
U.S. Cl. 188—252 **3 Claims**



1. A brake unit for railway wheels of the type having a rim provided at one side with an annular rail engaging tooth or flange, comprising a shoe mounting a brake block adapted for engaging said rim and a support structure for said shoe, an arch have side walls upstanding from said shoe defining a cavity and having aligned side wall openings, a braking flange adapted to be detachably mounted on said shoe and comprising branches of unequal length, friction means on the longer of said branches for engaging the wheel flange or tooth when the brakes are applied, a rod structure having a substantially U-shape with side walls fixed to the shorter of said branches and projecting into said cavity with a snug fit and having aligned openings in its side walls adapted to align with the openings in said arch side walls, and a removable retaining pin extending through all of said aligned openings securing said shoe and braking flange to said support structure and cooperating with said side walls to prevent further insertion and withdrawl of said braking flange relative to said shoe.

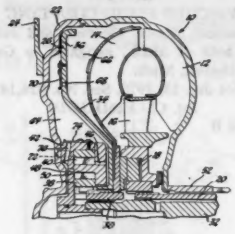
4,181,203

CONTROL FOR A TORQUE CONVERTER SLIPPING CLUTCH

John D. Malloy, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 14, 1978, Ser. No. 933,159
Int. Cl.² F16D *39/00*; F16H *41/18*
U.S. Cl. 192—3.3 **1 Claim**

1. A control mechanism for a torque converter and slipping clutch wherein the torque converter has an input member and an output member and the clutch has a single plate member drivingly connected with the output member and slippingly engageable with the input member and wherein the engagement force of said clutch is proportional to the pressure differential across said single plate member, said control mechanism comprising; a positive displacement hydraulic translating unit including a body portion and an expansible chamber portion which portions cooperate to displace liquid through said hydraulic translating unit when relative motion is present between said portions, said body portion being drivingly connected with one of said torque converter members and having formed therein inlet and outlet liquid passages, said expansible chamber portion being drivingly connected with the other of said torque converter members whereby relative motion between said torque converter members causes liquid to be displaced through said hydraulic translating device from one side of said single plate member to exhaust thereby controlling the pressure on said one side of said single plate member to control the slipping engagement of said clutch.

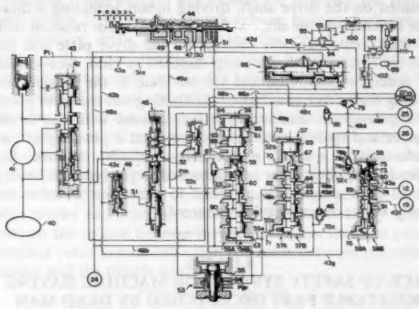


4,181,204

OIL PRESSURE CONTROL MEANS FOR AN AUTOMATIC TRANSMISSION

Atsuhiko Ito, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 27, 1977, Ser. No. 846,128
Claims priority, application Japan, Jun. 16, 1977, 52-71443
Int. Cl.² F16H *57/10*
U.S. Cl. 192—4 A **6 Claims**



1. An oil pressure control means for an automatic transmission which comprises a fluid torque converter and a speed shift gear means including a speed shift gear mechanism and a plurality of friction engaging means, said oil pressure control means comprising a source of oil pressure, a line pressure regulating valve which generates a line pressure from the oil pressure of said source, a throttle pressure regulating valve which generates a throttle pressure corresponding to the throttle opening, a governor valve which generates a governor pressure corresponding to the vehicle speed, a manual shift valve for shifting speed ranges, a plurality of speed shift valves which change over the supply of oil pressure to said friction engaging means of said speed shift gear means depending upon the balance of said throttle pressure and said governor pressure, and a brake-sensitive control means including a brake-sensitive means for sensing operation of a brake pedal and adapted to shift one of said speed shift valves which establishes the highest speed stage compulsorily to the downshift side by overriding the balance of said throttle pressure and said governor pressure when said brake-sensitive means has sensed operation of the brake pedal, said brake-sensitive control means further including a drain port which opens a middle portion of a passage conducting the line pressure to a drain passage and a

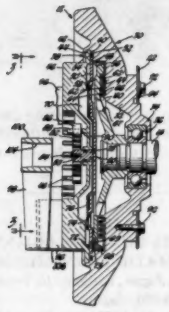
solenoid valve which selectively opens or closes said drain port.

4,181,205

VISCOUS FLUID COUPLING

Donald F. Mennucci, Mount Clemens, and John T. Auman, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 13, 1978, Ser. No. 924,147
Int. Cl.[2] F16D *35/00*
U.S. Cl. 192—58 B **4 Claims**



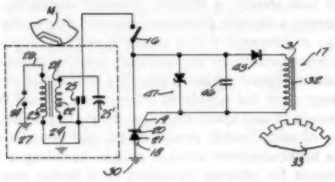
1. In a viscous fluid coupling for vehicle use having a drive shaft, driven means including a housing comprising a front cover member having cooling fins thereon and rotatably mounted on the drive shaft, driving means including a drive plate mounted on the shaft within the housing for rotation with the shaft, opposed shear surfaces on the drive plate and the adjacent surface of the housing disposed in close face-to-face and spaced relationship, and viscous fluid in the housing for creating fluid drive coupling of the housing and the drive plate, the improvement comprising a hub coaxial with the cover member and spaced axially therefrom, and a plurality of circumferentially spaced, substantially radially oriented fan blades having their inner ends attached to the hub and having at least their outer ends attached to the cover member inwardly of the outer periphery thereof.

4,181,206

BACK-UP SAFETY SYSTEM FOR MACHINE HAVING ROTATABLE PART DECLUTCHED BY DEAD MAN CONTROL

Richard W. Seilenbinder, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jan. 23, 1978, Ser. No. 871,542
Int. Cl.[2] A01D *53/00*; F16D *67/02*
U.S. Cl. 192—0.084 **5 Claims**



1. In a machine comprising an internal combustion engine with a magneto ignition system wherein there is a grounding terminal that can be grounded for stopping the engine, a rotatable work performing member that is potentially dangerous when rotating, a clutch through which said work performing member can be rotatably driven by the engine and which can be disengaged to disconnect the work performing member from the engine, and a dead man control element biased to a released position and having a connection with said clutch whereby the clutch is engaged only while said dead man control element is maintained in an operative position against its bias, safety means for stopping the engine in the event the dead man control element is released and the work performing member continues to rotate, said safety means comprising:

A. a switch having open and closed conditions, said switch being

(1) operatively associated with said dead man control element, and

(2) arranged to be in its open condition when said dead man control element is in its operative position and to be in its closed condition when said dead man control element is in its released position;

B. a sensor operatively associated with said work performing member and arranged to produce an electrical output whenever said work performing member is rotating;

C. an electrical switching instrumentality of the type that has at least three terminals, one of which comprises a biasing terminal, and which is normally non-conducting but provides for conduction of current between two others of its terminals in response to flow of biasing current at its said one terminal, said one terminal being connected with said sensor; and

D. means connecting said grounding terminal, said switch and said two other terminals of the electrical switching instrumentality in a grounded series circuit whereby said grounding terminal is grounded when

(1) said switch is in its closed condition and

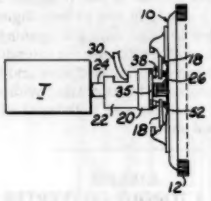
(2) biasing current from said sensor is flowing at said one terminal of the electrical switching instrumentality.

4,181,207

CLUTCH THROW-OUT BEARING PLATE

Tommy J. Blaylock, 2448 NW. 3, Oklahoma City, Okla. 73107

Continuation-in-part of Ser. No. 799,448, May 23, 1977, Pat. No. 4,114,744. This application Jul. 17, 1978, Ser. No. 925,066
Int. Cl.[2] F16D *23/14*
U.S. Cl. 192—98 **2 Claims**



1. In a vehicle clutch assembly having a flywheel and a clutch pressure plate movable toward and away from the flywheel by a plurality of radially inwardly projecting clutch release fingers, a transmission input shaft connecting the clutch pressure plate with a transmission and having a clutch throw-out bearing coaxially mounted on the shaft and movable toward and away from the inwardly directed end portions of said clutch release fingers, the improvement comprising:

a bearing plate comprising a flat ring-like plate coaxially surrounding said transmission input shaft and interposed between said throw-out bearing and the inwardly directed end portions of said clutch release fingers; and,

a plurality of connector means connecting said bearing plate with said fingers permitting limited movement of said clutch release fingers in a radial direction with respect to said bearing plate when said throw-out bearing plate and said clutch release fingers are moved toward and away from said clutch pressure plate,

each said connector means comprising a stud bolt having

its shank threadedly engaged with the respective said finger and having a head portion projecting toward said bearing plate; and,

bolt attaching means pivotally connecting said bolt head portion with said bearing plate,

said bolt attaching means comprising a tubular housing loosely surrounding said bolt head portion and secured at one end with one face of said bearing plate and having its other end portion turned inwardly toward the bolt shank, and,

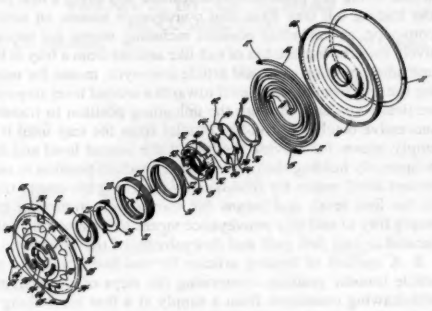
resilient material surrounding said bolt head end portion within said housing and having a neck portion projecting outwardly of said other end portion of said housing toward said clutch release finger.

4,181,208

VIBRATION DAMPER WITH THREE SETS OF SPRINGS IN PARALLEL

Richard L. Davis, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1978, Ser. No. 906,961
Int. Cl.² F16D *3/68*
U.S. Cl. 192—106.1 **6 Claims**



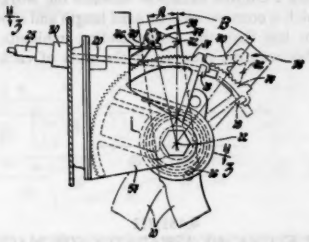
1. A friction clutch and torsional vibration damper comprising; a clutch plate having a friction element secured thereto; a spring retainer plate secured to said clutch plate and cooperating therewith to form a spring housing; an output hub mounted in said spring housing for angular movement relative to said clutch plate; first stage spring means in said spring housing for providing a resilient drive between said clutch plate and said output hub during a first predetermined amount of relative angular movement including a pair of spiral springs each having an outer end secured to said spring retainer plate at diametrically opposed locations and an inner end drivingly connected to said output hub at diametrically opposed locations; second stage spring means in said spring housing cooperating with said first stage spring means for providing a resilient drive between said clutch plate and said output hub during a second predetermined amount of relative angular movement having a pair of torsion springs each having a drive end drivingly connected to said output hub and a driven end operative to be driven by said spring retainer plate after the first predetermined amount of relative angular movement between said clutch plate and said output hub; and third stage spring means in said spring housing cooperating with said first and second stage spring means for providing further relative movement between said clutch plate and said output hub including a pair of torsion springs each having a drive end drivingly connected to said output hub and a driven end operative to be driven by said spring retainer plate after the second predetermined amount of relative angular movement between said clutch plate and said output hub.

4,181,209

CLUTCH ASSEMBLY WITH WEAR COMPENSATION ADJUSTMENT

Robert F. Wheaton, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1978, Ser. No. 894,579
Int. Cl.² F16D *13/75*
U.S. Cl. 192—111 A **2 Claims**



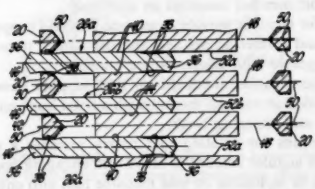
2. An improvement in a clutch assembly having a manual engagement and disengagement control and wherein a cable means transmits the control force from the manual control to the clutch release bearing which is subject to the clutch apply spring force and an engageable wear-compensating drive mechanism is disposed between the manual control and the cable means which is released during a portion of the manual control travel to permit adjustment in the clutch assembly to compensate for wear of the clutch plate, the improvement comprising a lash control mechanism for relieving the clutch apply spring force on the clutch release bearing including a load sensitive drive mechanism having drive means urged continuously into a driving connection between the manual control and the cable means and being disengageable during the portion of manual control travel when wear compensating drive mechanism is released to permit relative motion between the manual control and the cable means if the clutch apply spring force on the release bearing is above a predetermined value and being engaged during the said portion of manual control travel to ensure continued unitary movement of the cable means and manual control if the clutch apply spring force on the release bearing is equal to or less than the predetermined value to establish a lash condition between the release bearing and the clutch apply spring.

4,181,210

CLUTCH WITH INTERLOCKING TEETH

William H. Bibbens, N. Park Towers, Apt. 820, 16500 N. Park Dr., Southfield, Mich. 48075

Filed May 24, 1978, Ser. No. 909,250
Int. Cl.² F16D *23/02*
U.S. Cl. 192—114 T **5 Claims**



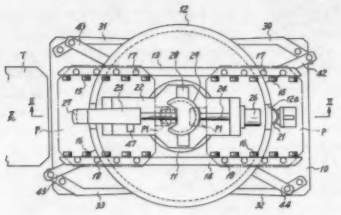
1. Torque transmitting apparatus comprising: a shiftable sleeve member having a plurality of splines spaced circumferentially about the central axis thereof; said splines including at least one locking spline having opposite ends and a pair of working faces extending therebetween; each working face of

each locking spline having a pair of recesses respectively adjacent the opposite spline end in order to provide axial locking of the sleeve member during the transmission of torque; the recesses at each end of each locking spline being spaced from each other with substantially the same minimum chordal relationship as each other locking spline end; said splines also including at least one guiding spline having opposite ends and a pair of working faces extending therebetween; and each guiding spline having a chordal thickness between the working faces thereof which is constant over its axial length and substantially equal to or less than the corresponding minimum chordal thickness between the recesses at the ends of each locking spline.

4,181,211
PALLET EXCHANGE APPARATUS FOR MACHINE TOOL

Hideo Nishimura, Nagoya; Kenji Nomura, Chita; Fumihiko Ohkoshi, Anjo; Akira Tsuboi, Kariya; Yoji Kamiya, Anjo; Kazuo Eguchi, Ichinomiya, and Kunimichi Nakashima, Anjo, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed May 23, 1978, Ser. No. 908,663
Claims priority, application Japan, May 26, 1977, 52-61604
Int. Cl.[2] B23Q 7/02
U.S. Cl. 198—339 **8 Claims**



1. A pallet exchange apparatus for a machine tool comprising:

a base;

a rotary member carried on said base to be rotatable in a horizontal plane;

pallet support means mounted on said rotary member for movably supporting on opposite ends thereof a pallet unloaded from said machine tool and a pallet to be loaded into said machine tool, each pallet being provided with an engaging hook;

a support member mounted on said base;

a transfer member movably supported on said support member and formed at one end thereof with a transfer hook engageable with said engaging hook;

a bracket member mounted on said support member and provided at one end thereof with a fixed hook engageable with said engaging hook;

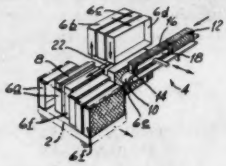
drive means for rotating said rotary member a predetermined angular amount to move said engaging hook of the pallet to be loaded on said machine tool into engagement with said transfer hook and to move said engaging hook of the pallet unloaded from said machine tool into engagement with said fixed hook of said bracket member; and

feed means for moving said transfer member a predetermined amount to move the pallet to be loaded on said machine tool toward said machine tool.

4,181,212
METHOD AND APPARATUS FOR FEEDING CONTAINERS FOR ROD-LIKE ARTICLES

Dennis Hinchcliffe, London, England, assignor to Molins, Ltd., England

Continuation-in-part of Ser. No. 651,532, Jan. 22, 1976, abandoned. This application Mar. 8, 1978, Ser. No. 884,570
Claims priority, application United Kingdom, Jan. 31, 1975, 4231/75
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—419 **9 Claims**



3. Apparatus for unloading trays containing rod-like articles, comprising tray conveyance means for supplying a succession of full trays at a first level, means for successively transversely withdrawing at a predetermined position and along a first path the leading full tray from said conveyance means, an article conveyor, an unloading position including means for successively transferring batches of rod-like articles from a tray at the unloading position onto said article conveyor, means for moving the tray from the first level towards a second level stepwise vertically upwards through the unloading position to transfer successive batches of rod-like articles from the tray until it is empty, means for moving the tray at the second level and for temporarily holding the tray in an intermediate position at said second level, means for subsequently returning the empty tray to the first level, and means for transversely returning the empty tray to said tray conveyance means along a second path parallel to said first path and downstream of the full trays.

5. A method of feeding articles for rod-like articles to an article transfer position, comprising the steps of successively withdrawing containers from a supply at a first level along a first path, raising the containers to a second level, advancing said containers on said second level toward said article transfer position, temporarily holding said containers at an intermediate position on said second level, advancing said containers from said intermediate position to said transfer position and returning the containers to the first level, the containers passing through said article transfer position while moving between the first and second levels, wherein the containers are returned to said supply along a second path parallel to the first path.

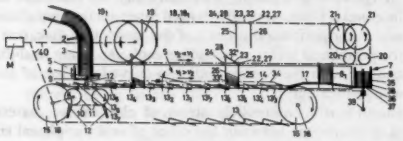
4,181,213
APPARATUS FOR FORMING STACKS OF FLAT ITEMS

Gert Deutschländer, Neuhausen am Rheinfall, and Martin Löw, Löhningen, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jun. 1, 1978, Ser. No. 911,308
Claims priority, application Switzerland, Jun. 2, 1977, 6812/77
Int. Cl.[2] B65G 47/26, 57/00
U.S. Cl. 198—419 **15 Claims**

1. Apparatus for forming a succession of stacks each containing a selected number of flat items, comprising: means defining at least one chain composed of a succession of pockets, said chain having an upper reach extending between an inlet location and an outlet location and said chain being movable to cause said pockets to travel in succession along the upper reach over a conveying path from the inlet location to the outlet location; feeding means disposed at the inlet location for intro-

ducing at least one flat item into each pocket in succession; stack forming means composed of at least one pair of vertical abutment rods disposed above said pockets and movable along said conveying path, said rods being positioned to engage the at least one item in each pocket and control its movement over



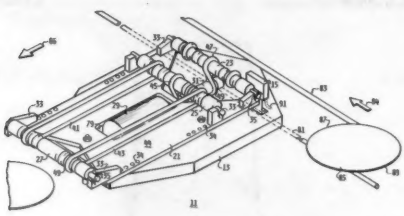
said conveying path; and means for moving said rods along said conveying path at a speed differing from the speed of travel of said pockets over said conveying path in a manner to cause said rods to push the at least one item from one said pocket onto the at least one item in an adjacent pocket to form the items into stacks.

4,181,214

WAFER TRANSFER APPARATUS

Peter R. Szasz, Menlo Park, and Harvey L. Schulte, Los Altos, both of Calif., assignors to Kasper Instruments, Inc., Sunnyvale, Calif.

Filed Nov. 25, 1977, Ser. No. 854,688
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—467 **10 Claims**



2. Apparatus for transferring workpieces to and from a conveyor having at least two spaced parallel conveyor belts for conveying workpieces disposed thereon, said apparatus comprising:

transport means for conveying workpieces laterally relative to the conveyor;

first sensor means disposed proximate to the conveyor for detecting a passing workpiece thereon without contacting the workpiece;

second sensor means disposed proximate to the transport means for detecting a passing workpiece thereon without contacting the workpiece;

rotatable means elevatably disposed proximate to the conveyor and coupled to the transport means for transferring workpieces between the conveyor and the transport means;

control means for raising the rotatable means relative to the conveyor to lift a workpiece from the conveyor in response to detection of a workpiece by the first sensor means, and for thereafter lowering the rotatable means relative to the conveyor to deposit a lifted workpiece on the conveyor in response to detection of a workpiece by the second sensor means; and

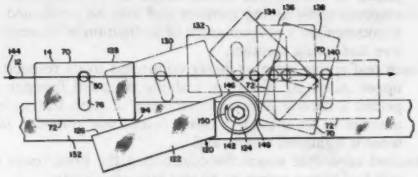
drive means coupled to the rotatable means and the transport means for driving the rotatable means and the transport means in one sense to move a lifted workpiece onto the transport means and laterally away from the conveyor in response to detection of a workpiece by the first sensor means, and for thereafter driving the transport means and the rotatable means in the opposite sense to move a lifted workpiece from the transport means onto the rotatable means above the conveyor.

4,181,215

GRAVITY TYPE CARRIER MECHANISM

William T. Carpenter, Churchville, Pa., assignor to National Drying Machinery Co., Philadelphia, Pa.

Filed Sep. 14, 1977, Ser. No. 833,159
Int. Cl.[2] B65G *47/34*
U.S. Cl. 198—483 **30 Claims**



1. In a tray turnover mechanism for use in a conveyor system wherein a conveyor transports a plurality of trays which are suspended by gravity from pins carried by the conveyor, which trays comprise a top, a bottom and a pair of spaced heads, the combination of

slot means provided in the heads of a tray to receive a pin therein in sliding engagement,

said tray being movable relative to the pin along the slot means;

cam means secured adjacent said conveyor system in position to turn over a tray as it is transported,

said cam means comprising a surface which is contacted by a portion of a tray,

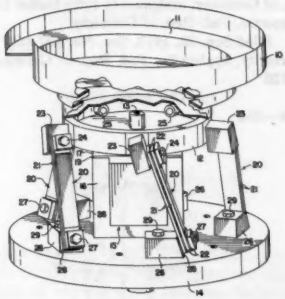
said cam means being adapted to raise a tray while being transported by the conveyor system by moving the tray relative to the pin along the said slot means.

4,181,216

REVERSIBLE VIBRATOR, BOWL FEEDER WITH ANGLED SPRING SUPPORTS

George Cipu, 2215 Clarence Ave., Lakewood, Ohio 44107

Filed Nov. 25, 1977, Ser. No. 854,700
Int. Cl.[2] B65G *27/02*
U.S. Cl. 198—757 **3 Claims**



1. In a vibratory parts feeder including a generally circular base flexibly supported on a massive mounting plate by a plurality of leaf spring members extending angularly upward from said mounting plate and arranged in a circular symmetrical array about the axis of said base, an electromagnetic motor mounted on said mounting plate, an armature mounted on the bottom of said base and in operative relationship with said electromagnetic motor, alternating current supply means con-

nected to said electromagnetic motor and a feeder bowl with an upwardly inclined spiral ramp formed therein, the improvement which comprises:

first reversible means for connecting the upper ends of said leaf spring members to said base at symmetrically spaced locations around the circumference of said base,

said first reversible means comprising, for each leaf spring member, and upper mounting block secured to said circular base, said upper mounting block being adjustable relative to said base about a horizontal axis extending radially outward from said base whereby said block may be adjusted to correspond to the angle of inclination of its respective leaf spring member and may be positioned to accommodate a reverse angle of inclination of its respective leaf spring member,

each leaf spring member being connected to its respective upper mounting block by a single threaded fastener to permit a natural unstressed securing of each leaf spring member to its respective block before said threaded fastener is tightened down, and

second reversible means for connecting the lower ends of said leaf spring members to said mounting plate,

said second reversible means comprising for each leaf spring member, a lower mounting block secured to said mounting plate and having a surface beveled at an angle relative to said mounting plate that conforms to the desired angle of inclination of said leaf spring member, said lower mounting block being adapted for pivotal adjustment about a vertical axis to conform to the orientation of its respective leaf spring member and to accommodate a reverse angle of inclination of its respective leaf spring member,

each leaf spring member being secured against said beveled surface of its respective lower mounting block by a single threaded fastener to permit a natural unstressed securing of each leaf spring member to its respective lower mounting block before said threaded fastener is tightened down,

said second means being spaced closer to said axis of said base than said first means whereby the lower ends of said leaf spring members are spaced radially inwardly of the upper ends thereof and said leaf spring members extend angularly upwardly and outwardly relative to said axis of said base as well as angularly in a tangential plane relative to said base.

4,181,217

CONVEYOR-BELT DRUM

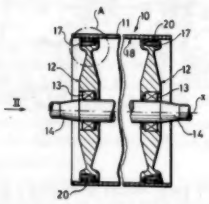
Fritz Huls, Velbert, and Paul W. Hentze, Wuppertal, both of Fed. Rep. of Germany, assignors to Fritz Steller GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,468

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736920

Int. Cl.[2] B65G *39/10*

U.S. Cl. 198—842 **11 Claims**



1. A conveyor-belt comprising:

a cylindrical shell having a cylindrically curved inner peripheral surface;

a shaft spacedly surrounded by and coaxial with said shell;

a pair of support disks spacedly mounted on said shaft within said shell, each of said disks having a frustoconically curved outer peripheral surface separated by an axially narrowing annular gap from said inner peripheral surface;

a plurality of segmental wedge members in each gap substantially complementing one another to a ring, each of said wedge members having a cylindrically curved outer surface and a frustoconically curved inner surface paralleling said outer peripheral surface of the respective disk, one of the peripheral surfaces bounding each gap being in sliding contact with the correspondingly curved surface of each wedge member;

a plurality of compressible strips of elastomeric material each interposed between the other of said peripheral surfaces and a spacedly confronting surface of a respective wedge member, the latter being provided on said confronting surface with an arcuate shoulder extending radially toward but terminating short of said other of said peripheral surfaces on the wider end of said gap; and

releasable adjustment means engaging each of said wedge members for axially displacing same toward the narrower end of said gap along the contacting peripheral surface with axial entrainment of the respective compressible strip.

4,181,218

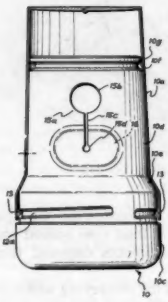
PRE-MOIST TISSUE DISPENSING CONTAINER

Raymond W. Cox, Grays Point, Australia, assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 21, 1978, Ser. No. 879,831

Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—205 **1 Claim**



1. In a container for storing and for dispensing sheet material, the container comprising:

(a) a hollow base;

(b) a cap adapted to fit over the hollow base to form a closed container;

(c) an aperture in the hollow base and an aperture in the cap through which when the container is in an open position sheet material may be extracted from the container; the improvement comprising:

(d) the hollow base comprising an end wall and a side wall, the exterior of which includes a frusto conical portion;

(e) the cap being a hollow cap having an end wall and a side wall, the interior of which includes a frusto conical portion corresponding to the frusto conical portion of the hollow base and the hollow cap being shaped for fitting over the hollow base with the frusto conical portion of the cap side wall coming into engagement with the frusto conical portion of the hollow base side wall when the cap and base are in an assembled position;

(f) the cap and the base having respective interengageable retention means for retaining the cap on the base when in an assembled position, the cap being rotatable relative to the base about the common axis of said frusto conical

portions between a dispensing position and a closed position;

(g) the apertures in said cap and said base being in said respective frusto conical portions, with the aperture in said base being smaller than the aperture in said cap, the aperture in the cap aligning with the aperture in the base when the cap is in said dispensing position and the aperture in the cap being out of alignment with the aperture in the base when the cap is in said closed position, the side wall of the hollow base around the smaller aperture therein being in the form of a depression whereby on assembly of the container a recess is defined between the walls of the depression and the overlying frusto conical side wall portion of the cap when the cap is in the closed position, said hollow base further comprising a secondary aperture of a diameter larger than said smaller aperture in a portion of the frusto conical side wall thereof which does not come into alignment with the aperture in the hollow cap in any rotatable position of the assembled container, and a slot interconnecting said secondary aperture and said smaller aperture; and

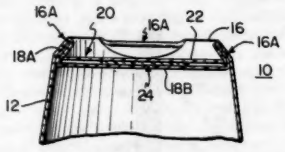
(h) when the cap is in said closed position surface contact is established between said frusto conical portions of the cap and base for substantially sealing the container.

4,181,219

CONTAINER HAVING PREMIUM-CONTAINING-AND-DISPENSING BOTTOM STRUCTURE AND METHOD AND APPARATUS FOR PROVIDING SAME

Thomas E. Marion, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Feb. 1, 1979, Ser. No. 8,575
Int. Cl.[2] B65D *11/02*
U.S. Cl. 206—217 **4 Claims**



1. In a container having a annular sidewall and a bottom web forming a primary product chamber therein, and an annular bottom curl forming a secondary chamber with said bottom web, an improved means for removably retaining an article in said secondary chamber, comprising:

a plurality of flattened areas extending along a cord of arc of the extreme periphery of said annular bottom curl and extending from said extreme periphery in a smooth transition with said sidewall to a position adjacent said bottom web to define a multi-faceted access opening to said secondary chamber; and

a disc sized to snap-in to said secondary chamber through said multi-faceted opening for retaining an article in said secondary chamber adjacent said bottom web.

4,181,220

DISPLAY PACKAGING INSERT

James A. Zicko, Natick, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,183
Int. Cl.[2] B65D *85/20, 81/00*
U.S. Cl. 206—315 R **1 Claim**

1. A one-piece foldable paperboard insert for holding and displaying, within an outer container, portions of articles such as golf clubs or the like, having elongated shafts with integral heads at corresponding ends thereof, comprising:

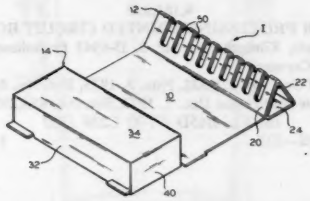
(a) a flat base panel having integral shaft supporting and head receiving members joined to opposite ends thereof;

(b) said shaft supporting member having a generally tubular structure and including:

(i) a bottom wall co-planar with and disposed adjacent one end of said base panel;

(ii) a pair of side walls having lower edges foldably joined to opposed sides of said bottom wall and converging upwardly therefrom and having upper edges joined to each other;

(iii) said side walls having a plurality of aligned slots defining openings for receiving and supporting portions of said article shafts;



(c) said head receiving member forming with said base panel a box-like structure open toward said shaft supporting member and including:

(i) a front wall spaced above and parallel to said base panel adjacent the other end thereof;

(ii) an end wall and a pair of side walls foldably joining the end and sides of said front wall to said base panel to form an enclosure for receiving said article heads;

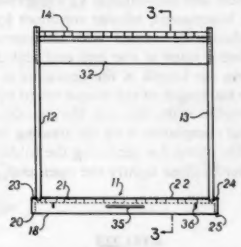
(d) said insert being arranged and disposed so that only one surface of the paperboard from which it is formed is visible from one side thereof when the insert is in erected condition.

4,181,221

PORTABLE GUN DISPLAY

Walter Tennant, P.O. Box 810, Livingston, Mont. 59047

Filed Oct. 26, 1978, Ser. No. 954,938
Int. Cl.[2] B65D *85/00*; A47B *81/00*
U.S. Cl. 206—317 **9 Claims**



1. A portable gun display including a base, supports extending upwardly from said base, a cross member connecting the upper portions of said supports, said base including two box sections each having side and end panels, a top panel joining said side and end panels, and an open bottom, said box sections being disposed next to each other with a side panel of one adjoining and parallel to a side panel of the other, hinge means connecting at least a portion of the edges of the adjoining side panels which are remote from said top panels, said top panels having support-receiving means disposed adjacent and inside said end panels, spaced gun butt-receiving slots in at least one of the top panels, said slots having a tapered bottom section, said supports being of a length less than the distance between

said end panels of each box section and having cross member-receiving means adjacent the upper portions thereof, said cross member being of a length less than the distance between said end panels of each box section and including means for connection thereof to the upper portions of the supports, and a plurality of spaced recesses along at least one substantially vertical surface thereof, whereby the cross member can be separated from said supports, said supports separated from said box sections, said hinge connected box sections inverted, said cross member and said supports positioned within said box sections and the open faces of said box sections closed on each other to form a unitary assembly.

4,181,222

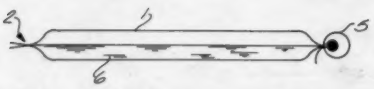
KIT FOR PROCESSING PRINTED CIRCUIT BOARDS

Peter Kepets, Königsberger Str. 2, D-6343 Frohnhausen, Fed. Rep. of Germany

Division of Ser. No. 628,532, Nov. 3, 1975, Pat. No. 4,082,605. This application Dec. 1, 1977, Ser. No. 856,295

Int. Cl.[2] **B65D** *77/00;* **C23F** *1/02*

U.S. Cl. 206—223 **11 Claims**



1. A kit for treating circuit boards by etching, plating or developing with a liquid treating solution comprising:

(a) a transparent, flexible, tubular container for holding the treating solution in contact with the circuit board, the container having an opening at one end and a permanent seal closing the other end, wherein the length of the container is adjustable to conform to the length of the circuit board by folding over different lengths at the one end of the container to close the opening, and the container is made of a material compatible with the treating solution;

(b) a removable clamp for receiving the folded over end of the container and for temporarily closing the opening; and

(c) liquid treating solution within the container.

6. A kit for treating circuit boards by etching, plating or developing with a liquid treating solution, the treating solution containing a solute and solvent, the kit comprising;

(a) a flexible, transparent, tubular container for holding the treating solution in contact with the circuit board, the container being open at one end and sealed at the other end, wherein the length of the container is adjustable to conform to the length of the circuit board by folding over different lengths of the one end, the container being made of a material compatible with the treating solution;

(b) a removable clamp for receiving the folded over end of the container to close tightly the open end; and

(c) the solute.

4,181,223

SELF-PACKAGED MEDICAL DEVICE WITH FRANGIBLE SEAL

Marcus J. Millet, New York, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 25, 1978, Ser. No. 909,335

Int. Cl.[2] **B65D** *85/00, 17/16;* **A61M** *5/32*

U.S. Cl. 206—365 **13 Claims**

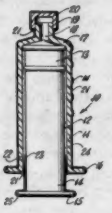
1. An improved self-packaged medical device for dispensing fluids of the type having:

(a) a hollow body with boundary walls defining an interior space, a hole in a boundary wall for communication between the interior space and the outside of the body, and a flow passageway through a boundary wall communicating with the interior space and the outside of the body;

(b) a handle extending through said hole from an end within said interior space to an end outside of the body;

(c) means for controlling flow of a fluid into and out of the interior space positioned within the interior space and attached to the handle for motion therewith; and

(d) releasable means for sealing said flow passageway during storage,



wherein the improvement comprises: a continuous, frangible film extending from said body to said handle around the entire perimeter of said hole to completely seal said hole against entry of microorganism until the handle is moved, said film adhering to the body and the handle and being readily fractured upon motion of the handle to thereby allow free movement between said handle and said body.

4,181,224

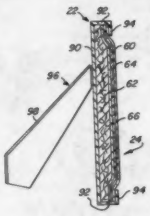
APPARATUS FOR HOLDING PIERCED EARRINGS FOR DISPLAY AND/OR STORAGE

Dick S. Aber, 3219 S. Holly St., Denver, Colo. 80222

Filed Mar. 19, 1979, Ser. No. 21,762

Int. Cl.[2] **B65D** *85/58*

U.S. Cl. 206—486 **2 Claims**



1. Apparatus for holding earrings for pierced ears, said earrings having a decorative portion and a shaft portion, the shaft portion being elongated and having a relatively small diameter, generally circular peripheral configuration, the apparatus comprising:

a base; and

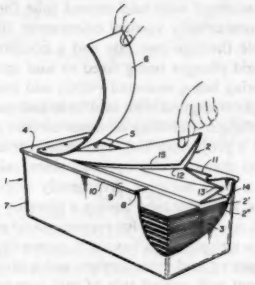
earring retention means on the base for retaining at least one earring for pierced ears in removable, fixed relationship with respect to the base, the earring retention means comprising, an outer layer of sheet plastic material overlaying the base; an inner layer of sheet plastic material interposed between the outer layer of sheet plastic material and the base; a first layer of filler material located between the inner and outer layers of sheet plastic material and maintaining the inner and outer layers of sheet plastic material in spaced relationship with each other; and a second layer of filler material located between the base and the inner layer of sheet plastic material and maintaining the base and the inner layer of sheet plastic material in spaced relationship with each other; the inner and outer layers of sheet plastic material having a plurality of holes therethrough sized about the same size as, or slightly smaller than, a

shaft portion of a pierced earring to be retained on the apparatus, with each hole through the inner layer of sheet plastic material being located in direct axial alignment with a corresponding hole through the outer layer of sheet plastic material, thereby permitting passage of the shaft portion of the pierced earring through a hole in the outer layer of sheet plastic material, the first layer of filler material, the corresponding hole in the inner layer of sheet plastic material and into the second layer of filler material.

4,181,225
WET-TISSUE PACK

Hans Spiegelberg, Taby, Sweden, assignor to Salva S.A., Switzerland

Division of Ser. No. 329,967, Feb. 6, 1973, Pat. No. 4,143,762.
This application Nov. 25, 1974, Ser. No. 526,850
Claims priority, application Sweden, Feb. 22, 1972, 2119/72
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—494 **2 Claims**



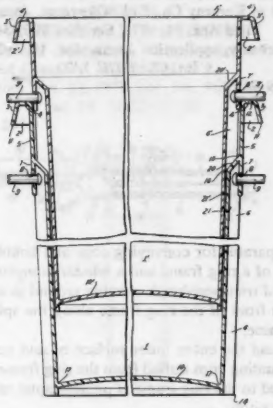
1. A tissue pack comprising a substantially closed parallelepiped container having a longitudinally elongated central opening in the top wall and a plurality of individually folded tissues located therein, each of said tissues being individually folded to form in cross section a substantially planar center portion having two substantially Z-shaped sections folded contiguously therewith along each edge thereof, said Z-shaped sections being formed along first fold lines parallel to the longitudinal center of said tissue located equidistant from each of the longitudinal edges forming three layers one on top of the other, the free edges of the sheet having second folds equidistant from the first fold lines to form a lower layer, a middle layer and an upper layer of substantially equal size, the free edges lying adjacent their respective first folds and the second folds lying substantially along the longitudinal center of the tissue, said side sections being folded to respectively lie above and below said center portion so that when said folded tissues are stacked one on top of the other within said container the second fold of the upper Z-shaped section of each tissue lies beneath the opening of the top wall and the second fold of the lower Z-shaped section lying adjacent the second fold of the upper Z-shaped section of the tissue lies directly below it in the stack, to thereby provide upper and lower Z-shaped sections of adjacent tissues in the same plane.

4,181,226
PLASTIC BUCKET

Franz Weinert, Hamburg, Fed. Rep. of Germany, assignor to Firma Weinert & Co., Hamburg, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,575
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703721
Int. Cl.[2] B65D *21/00, 25/32*
U.S. Cl. 206—519 **12 Claims**

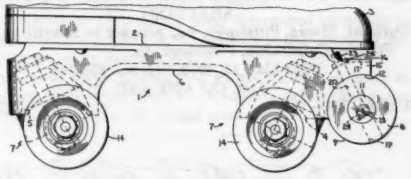
1. A bucket, comprising an elongated tubular side wall defining an interior of the bucket and including a wide rim-forming upper end portion and a narrow lower end portion, said side wall being formed with at least one elongated inwardly convex portion forming an outwardly open groove extending inside the interior of the bucket, said side wall further having an integral portion substantially planar with the latter and defining a web at least partially and circumferentially closing said groove so as to define a space between the outer surface of the inwardly convex groove and the inner surface of the web; a completed bail having diametrically opposed ends, each having a first portion pivotally received through a respective hole in said web in said space and a second portion extending outwardly radially away from said first portion and from the interior of the bucket, said second portion of said bail having abutting means for abutting the rim-forming upper end portion of a lower bucket when a plurality of such buckets are rested so as to limit nesting where the respective upper bucket is nested in the respective lower bucket.



4,181,227
ROLLER SKATE BRAKING ASSEMBLY

Edward Balstad, Box 90, Cambridge, Wis. 53523

Filed Aug. 3, 1978, Ser. No. 930,671
Int. Cl.[2] A63C *17/14*
U.S. Cl. 280—11.2 **5 Claims**



1. A roller skate comprising:
(a) a foot plate,
(b) fore and aft wheel mounting assemblies mounted to said foot plate,
(c) said foot plate having a forwardly extending wall portion forming an arcuate socket on its under side and a longitudinal arcuate slot communicating between said socket and the top wall side,
(d) a cylindrical braking member having the same radius as said socket and with said member seated in said socket and disposed on a transverse horizontal axis,
(e) and connecting means extending through said slot and

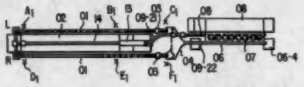
joining said braking member and said wall for securing said member in place in said socket.

4,181,228

APPARATUS FOR CONVEYING COPS AND BOBBINS FOR DIRECTLY CONNECTING RING FRAME WITH WINDER

Kiyozi Hashimoto; Tsuyoshi Shimatani; Takemi Yamamoto; Ryoichi Morimoto, and Ikuo Ueda, all of Okayama, Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed Apr. 14, 1978, Ser. No. 896,334
Claims priority, application Japan, Apr. 15, 1977, 52/43739
Int. Cl.[2] B07C *5/00*
U.S. Cl. 209—552 **7 Claims**



1. An apparatus for conveying cops and bobbins for direct connection of a ring frame and a winder comprising:

one line of transport-bands running around in a longitudinal path in front of the ring frame along the spindles of said ring frame;

pegs around the entire outer surface of said transport-band for mounting cops doffed from the ring frame and bobbins to be fed to the ring frame at pitches equal to a half of the spindle pitch;

cop releasing means at one end of an extension in the longitudinal direction of said ring frame and of said transport-band;

bobbin feeding means for feeding bobbins to said transport-band at the other end, opposite to that of said cop releasing means, of said transport-band;

a bobbin guide of said bobbin feeding means located just before said transport-band and being positioned so that a distance equal to $(N+\frac{1}{2})\times L$, (N: zero (0) or positive integer, L: spindle pitch), lies between the center of said guide and that of said spindle; and

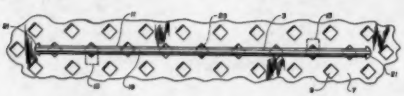
means for moving said transport-band in one direction intermittently for enabling simultaneous performance of both cop feeding to a subsequent process and bobbin receiving by the transport-band.

4,181,229

RESILIENT PARTITION FOR USE WITH PERFORATED SHELVING

David M. Moore, Pittsburgh, Pa., assignor to Armstrong Store Fixtures Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,668
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—184 **9 Claims**



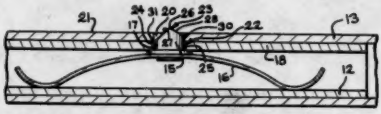
1. A shelf partition for use with perforated shelving comprising an elongated planar body member and a pair of spaced feet extending laterally out of the plane of said planar body member in opposite directions from one elongated edge thereof, said planar body member being resilient yet stiff such that it may be twisted about a longitudinal axis to insert one and then the other of said feet into spaced perforations in said perforated shelving to secure said body member upright on said shelving when the twist is released.

4,181,230

STORE DISPLAY FIXTURE

David W. Acuff, Paragould, Ark., assignor to Darling Store Fixtures, a division of the Marmon Group, Inc., Paragould, Ark.

Filed Dec. 16, 1977, Ser. No. 861,425
Int. Cl.[2] A47F *5/13*
U.S. Cl. 211—208 **11 Claims**



1. A store display fixture for hanging garments and the like having at least one hangrod affixed to at least one downwardly extending first tube in telescopic engagement with a second tube, means associated with said second tube for maintaining said tubes in substantially vertical orientation, the inner tube including a hole through one side and a compression spring and plunger, said plunger being fixed to said spring and said plunger and spring being mounted within said inner tube such that said plunger is aligned with said hole and projects therethrough, said plunger including an outer surface parallel to its major axis and a projecting end, said outer surface including first and second diametrically opposed sides, said projecting end including a peak between divergently sloping first and second surfaces, the outer tube having a plurality of vertically aligned, spaced apart openings for receiving said plunger, each of said spaced apart openings having a supporting edge adjacent said first side of said outer surface and a plunger-deflecting edge adjacent said second side of said outer surface, said first side of said outer surface intersecting said sloping first surface at least as far out from said inner tube as said supporting edge, said second side of said outer surface intersecting said sloping second surface inward from said plunger-deflecting edge, whereby said tubes may be telescopically extended by exerting an upward force against said first tube thereby engaging said plunger-deflecting edge with said sloping second surface and depressing said plunger until it positions itself within the desired opening in said outer tube, and whereby said tubes may be retracted by manually depressing said plunger and allowing said first tube to fall until said plunger positions within the desired opening in said outer tube.

4,181,231

POLAR WYE CRANE

George F. Morrissey, Jr., Fremont, and Lawrence A. Wright, Alameda, both of Calif., assignors to Paceco Division of Fruehauf Corporation, Alameda, Calif.

Filed Aug. 22, 1977, Ser. No. 826,717
Int. Cl.[2] B66C *17/02*
U.S. Cl. 212—21 **20 Claims**

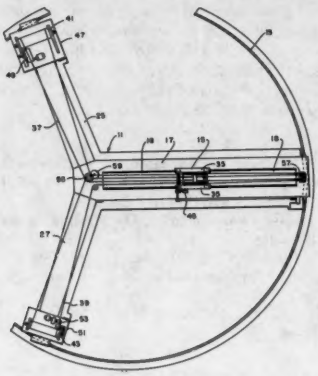
1. A bridge crane for a circular track comprising

a first horizontal gantry leg having a length longer than the radius of generation of said circular track with the outboard end of said gantry leg disposed for movement along said circular track and the inboard end of said gantry leg being disposed within the circumference of said circular track and over the center of generation of said circular track,

a pair of horizontal gantry legs having their inboard ends secured to the inboard end of said first gantry leg and their outboard ends disposed for movement along said circular track,

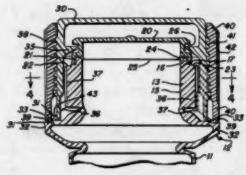
means disposed at the outboard ends of said gantry legs for engaging said circular track and permitting movement therealong,

a trolley mounted on said first gantry leg for movement therealong,
means for moving said trolley along said gantry,



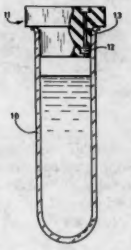
a wire rope reeving system and hoist means for raising and lowering a load suspended from said trolley, and
means for rotating said crane on said circular track.

4,181,232
SEALED CLOSURE FOR PLASTIC CONTAINER WITH INTERLOCKING PROTECTIVE OUTER CLOSURE
David Bellamy, Kenilworth, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Continuation of Ser. No. 871,320, Jan. 23, 1978, Pat. No. 4,111,325, which is a continuation of Ser. No. 777,749, Mar. 14, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,096
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—232 **7 Claims**



1. An improvement in a container having a hermetically sealed primary cap and overcap for storing and dispensing sterile liquids, which includes a thermoplastic bottle with a dispensing outlet, said bottle and overcap forming a unit that has a transverse abutment means surrounding the outlet, said improvement comprising, in combination: a bottle neck with a pouring lip surrounding the dispensing outlet; a primary cap closing the dispensing outlet and having a thin frangible section adjacent said dispensing outlet; an overcap covering said primary cap and bottle neck and having an area hermetically fused to said container proximate said abutment means and provided with a thin frangible section at said fused area; an outer ring over said overcap and overlying said transverse abutment means; interlocking means interconnecting said primary cap and said overlap limiting relative axial movement thereof, whereby upward axial movement of said overcap will jack said primary cap off said bottle neck; interlocking means interconnecting said overcap and said bottle neck limiting relative rotational movement thereof; and jacking means interconnecting said outer ring and said overcap, whereby rotation of said outer ring against said transverse abutment means moves said overcap axially upwardly to sever said frangible sections.

4,181,233
ONE-WAY VALVE STOPPER
Philip H. Gouveia, Metuchen, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.
Filed Nov. 15, 1978, Ser. No. 960,935
Int. Cl.[2] B65D *47/36*
U.S. Cl. 215—247 **4 Claims**

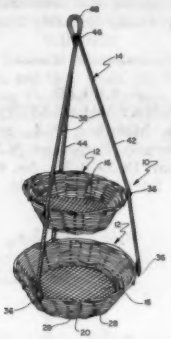


1. A one-way valve stopper for sealing a vacuum blood collection tube comprising:
an injection area in the stopper through which a needle can be inserted for passing blood from a vein into the tube;
a passageway extending through the stopper from the inside of the tube to the outside of the stopper, the said passageway being located in the stopper outside of the injection site;
a valve interposed in the passageway to open and close the passageway;
the said valve comprising:
a housing enclosing the valve having top and bottom openings;
a piston;
a plug at the end of the piston adapted to close the bottom opening and passageway;
a vent from the housing to evacuate pressure when the plug is open; and
a compression spring extending around the piston to keep the plug in a normally closed position;
the compression of the spring being determined according to the differentials between the pressure in the vein (Pv) and the pressure in the tube (Pv_1);
whereby when Pv_1 is greater than Pv the valve is actuated to the open position and when Pv_1 is equal to or less than P_v the valve will remain in the closed position.

4,181,234
BASKET CONSTRUCTION
Sean F. Feighan, P.O. Box 35, Broadway Station, Newport, R.I. 02840
Filed Feb. 15, 1979, Ser. No. 12,361
Int. Cl.[2] B65D *9/10*
U.S. Cl. 217—122 **8 Claims**

1. A basket comprising a vertically orientated sidewall constructed of at least one material strand interwoven so as to form runs of said strand material in adjacent vertical contact on top of each other at spaced positions about the periphery of said basket and laterally offset from each other between said spaced positions to form laterally spaced sets thereof, a plurality of relatively rigid vertically orientated rod-like supports spaced from each other around the periphery of said basket

and disposed between at least some of said sets of laterally spaced runs, a first group of said supports each terminating at the upper periphery of said sidewall in a radially outwardly directed loop through which two or more vertically adjacent top edge sidewall runs are disposed in contact therewith so as



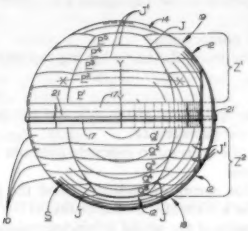
to maintain said top sidewall edge runs from unravelling, a second group of said supports each terminating in an enlarged substantially closed radially outwardly directed loop passing over said top sidewall edge runs, said enlarged loop receiving a supporting line therethrough so as to support said basket in an elevated position.

4,181,235

LIQUEFIED NATURAL GAS TANK CONSTRUCTION

Frank R. Baysinger, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 9, 1978, Ser. No. 868,014
Int. Cl.[2] B65D *7/04, 7/38*
U.S. Cl. 220—5 A **13 Claims**



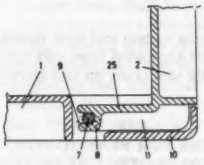
1. A spherical tank for liquefied natural gas and the like provided with hemispheres on opposite sides of the tank's equator, each of said hemispheres being comprised of a plurality of substantially symmetrical spherical triangular-like sectors, each sector being comprised of elongated quadrilateral plate members of compound curvature and having curvilinear marginal side and end edges and differing lengths, the longest plate member in a sector being located adjacent the equator of the tank and the remaining sector plate members being of progressively smaller lengths with the sector plate member of the smallest length being located adjacent a polar portion of the tank, the major axis and the side marginal edges of each of the plate members in a given sector all being located in generally parallel relation to each other and to the tank's equator, the curved minor axis dimensional width of each of said sector plate members in all of said sectors when measured at the midpoint of the curved major axis thereof being substantially the same, the top and bottom edges of the sectors in each hemisphere being substantially aligned, the number of sector plate members in each sector being equal, each plate member of one sector being substantially aligned with the corresponding sector plate members in each adjacent sector so as to form circular portions on the spherical tank parallel with great circles projected along the surface of the tank at a given longitudinal line, the sector plate members making up a given circular portion of the spherical tank all having substantially the same uniform thickness as well as substantially the same lengths along the major axis thereof and the midpoints of the major axis of the plate members in a sector also being in alignment, and the major axis of the sector plate members in all cases being larger than the minor axis.

4,181,236

COLLAPSIBLE AND STACKABLE PLASTIC TRANSPORT CASE

Ulrich H. Prodel, Grunstrasse 13, D-4902 Bad Salzuflen, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 833,998
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737867
Int. Cl.[2] B65D *7/24, 7/00*
U.S. Cl. 220—6 **7 Claims**



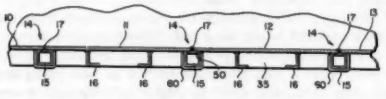
1. Collapsible and stackable plastic transport case comprising first and second pairs of like side walls, hinge means comprising a series of hinges hingedly connecting said side walls together at the corner of the case and a bottom hingedly connected with the lower edge of one of said side walls and foldable against the inner side of one side wall when said case is collapsed, each of the side walls of said first pair having one vertical edge hingedly connected by said hinge means with the adjacent vertical edge of a respective side wall of said second pair and having at the opposite vertical edge a connecting portion which projects inwardly a distance corresponding to the combined thickness of a side wall and the thickness of said bottom, said connecting portions being at diagonally opposite corners of said case and being connected by said hinge means with respective side walls of said second pair at a distance from the vertical edges thereof corresponding to the projection of said connecting portions to provide overhanging edge portions which extend beyond said hinge means and cover said connecting portions when the case is in set-up condition.

4,181,237

LIQUID STORAGE TANK WITH WELDED JOINT DRAIN CANAL SYSTEM AND WALL STIFFENER SYSTEM

John W. Kenyon, Bourbonnais; Lestle R. Shockley, Oak Forest, and Paul R. Van Niel, Bourbonnais, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 30, 1978, Ser. No. 938,240
Int. Cl.[2] B65D *7/42, 7/02, 25/00*
U.S. Cl. 220—71 **9 Claims**



1. In a liquid storage tank having a wall made of a plurality

of metal plates having adjacent abutting edges joined together by at least vertical welded joints, the improvement comprising:

at least some of the joints having an elongated tubular metal member with a surface in spanning contact with the welded joint for at least part of the joint length,

a plurality of spaced apart holes in the tubular member surface, in contact with the metal plates,

the joint being butt welded from one side with the tubular member in place spanning the other side of the joint, and

the side edges of the tubular member surface being joined by a continuous weld to the adjacent metal plates.

4,181,238

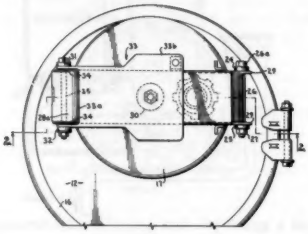
VENTING TANK CLOSURE

Paul W. Arnold, Kansas City; William L. Scofield, Lee's Summit; Ronald W. Borst, Kansas City, and Vern D. Scott, Independence, all of Mo., assignors to Clay & Bailey Manufacturing Company, Kansas City, Mo.

Filed Dec. 20, 1978, Ser. No. 971,186

Int. Cl.[2] B65D *45/28*

U.S. Cl. 220—314 **12 Claims**



1. A manhole cover for a liquid holding tank, comprising, in combination:

(a) A seat which defines and extends completely and circumferentially around an opening into the tank,

(b) A cover which closes said opening and is mounted to move into and out of engagement with the seat with one lower side thereof,

(c) A lock arm pivotably mounted at one end thereof upon said tank adjacent said seat, said lock arm disposed to extend over said cover, seat and opening when said cover is on said seat,

(d) A first opening through the center of the cover,

(e) A shaft connected at its upper end to said lock arm intermediate the ends thereof and extending through said cover central opening,

(f) A first spring mounting on said cover extending downwardly past the lower side thereof, said spring mounting aligned with said cover opening and having a second opening therethrough,

(g) Said shaft also extending through said second opening in said first spring mounting,

(h) A second spring mounting removably fixed to the lower end of said shaft,

(i) Spring means mounted at its upper and lower ends on the first and second spring mountings, respectively and disposed therebetween below said cover, said spring means operable to resiliently bias the cover on the seat when the lock arm is substantially parallel to the plane of the seat, and

(j) Latch means pivotably mounted on said tank adjacent said seat and movable into engagement with said lock arm for maintaining same extending across said tank opening in a position parallel to the plane of the seat, whereby to resiliently position said cover on said seat.

4,181,239

PLASTICS CONTAINER FOR PRESSURIZED CARBONATED BEVERAGES

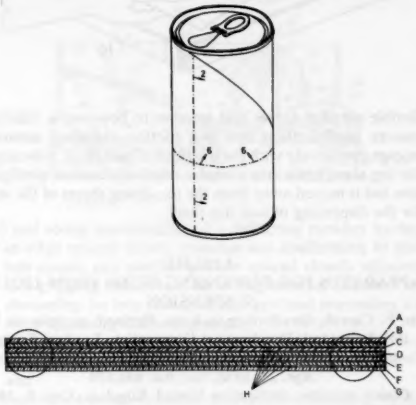
Robert Heiremans, Mariakerke, and André Depuydt, Ieper, both of Belgium, assignors to U C B, Societe Anonyme, Saint-Gilles-lez-Bruxelles, Belgium

Filed Mar. 8, 1978, Ser. No. 884,393

Claims priority, application United Kingdom, Mar. 8, 1977, 9712/77

Int. Cl.[2] A21D *10/02*; B65D *25/16, 5/56*; D03D *13/00*

U.S. Cl. 220—461 **21 Claims**



1. A container for packaing pressurized carbonated beverages having a cylindrical body provided with top and bottom end closures at the opposite ends thereof, said cylindrical body comprising:

(a) at least one film of a synthetic or semi-synthetic organic polymer having a permeability of oxygen lower than 6×10^{-13} ml.cm/cm^2.sec.cm of mercury at 25° C. and 0% relative air humidity;

(b) at least two films of a polyester; and

(c) at least two layers of an organic thermoplastic binder having a permeability to water vapor lower than 1×10^{-14} g.cm/cm^2.sec.cm of mercury at 38° C. and 90% relative air humidity,

all the films of (a) and (b) being adhesively bonded together by means of the binder of (c) in the form of a cylindrical body, the wall of which has a spirally or convolutely-wound structure, in which each film of (a) is separated both from the outside surface and from the inside surface of the cylindrical body by at least one film of (b) and at least one layer of (c).

4,181,240

FLEXIBLE DISPENSER FOR FLEXIBLE SHEETS

Charles R. Luchsinger, 14 Briarwood Dr., Glen Cove, N.Y. 11542

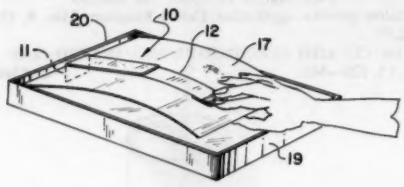
Continuation of Ser. No. 768,299, Feb. 14, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,232

Int. Cl.[2] B65H *3/52*

U.S. Cl. 221—39 **14 Claims**

1. A dispenser for a flexible sheet of material from a sheaf of stacked flexible sheets comprising a freely situated spatially self-disposingly restable anchor means having a corner portion arranged for horizontally stationarily disposed vertically downward resting contact against the top corner edge along a portion of one of the sides of the sheaf of stacked flexible sheets, a spatially self-disposingly restable flexible member extending forwardly from said anchor means to overlie the top sheet of such sheaf of stacked flexible sheets in self-disposing resting contact thereon and being locally bowable intermediate

its end portions out of its normal disposition upon rearward movement of such flexible member in a direction towards said anchor means, and stationary control imparting friction engaging means disposed on the underside of said flexible member whereby downwardly pressing rearward movement of said



flexible member causes said member to bow into a relatively convex configuration and said friction engaging means to engage operatively with the top sheet of said sheaf, whereupon the top sheet bows into a similar relatively convex configuration and is moved away from the remaining sheets of the sheaf for the dispensing of said top sheet.

4,181,241

APPARATUS FOR DISPENSING SEEDS FROM LIQUID SUSPENSION

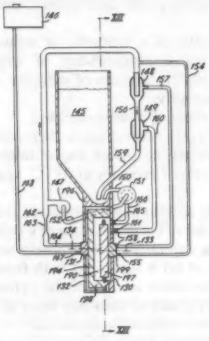
Ian E. Currah, Stratford-upon-Avon, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 730,284, Oct. 6, 1976. This application Apr. 21, 1978, Ser. No. 898,674

Claims priority, application United Kingdom, Oct. 8, 1975, 41220/75

Int. Cl.[2] A01C 7/18

U.S. Cl. 221—211 **34 Claims**



23. A method of dispensing discrete objects from a liquid comprising:

dispersing discrete objects in suspension in a liquid in a container having an outlet port for the exit of objects from the container,

capturing a number of the discrete objects against a capture orifice by applying across the capture orifice a pressure difference in a sense each as to cause exit of liquid from the container through the capture orifice,

producing relative movement between the capture orifice and the objects in suspension in the liquid in such a manner as to have the capture orifice situated in a region free from objects suspended in the liquid, and

producing a flow of liquid past the capture orifice such as to sweep away excess objects attracted to the capture orifice by the said pressure difference, and

removing a captured object or objects from the capture orifice at a required region for dispensing the object or objects.

4,181,242

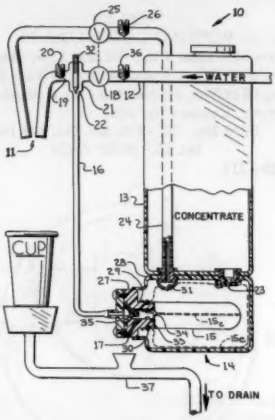
METHOD AND APPARATUS FOR DISPENSING A BEVERAGE

Alfred E. Zygiel, deceased, late of Dallas, Tex., and by Mary E. Zygiel, executrix, Port Orange, Fla., assignors to The Cornelius Company, Anoka, Minn.

Filed May 30, 1978, Ser. No. 871,303

Int. Cl.[2] B67D 5/56; G01F 11/08

U.S. Cl. 222—1 **2 Claims**



2. In a method of mixing and dispensing a beverage having the steps of:

(a) opening a water valve and passing a flow of water through a water line, from a pressurized source to a dispensing head;

(b) partially obstructing the flow of water and developing a bypass pressure downstream of the valve when the valve is opened;

(c) providing beverage concentrate in a concentrate pump;

(d) bypassing a discrete portion of the flow of water which is under the bypass pressure, from the water line and via a bypass line to the concentrate pump, and physically separating the bypassed water from the concentrate within the pump;

(e) transferring the bypass pressure through the bypassed water and against the concentrate in the pump, and pumping concentrate from the pump to the dispensing head with the bypass pressure by displacing the concentrate within the pump with bypassed water;

(f) mixing the flowing water at the dispensing head with the concentrate pumped to the dispensing head and dispensing the mixed water and concentrate as a drinkable mixed beverage; and

(g) closing the water valve and simultaneously terminating flow of all water and concentrate to the dispensing head;

the improvement comprising the further steps of:

(1) draining a portion of the discrete bypassed water from the bypass line directly to a waste outlet during and simultaneously with the pumping of the concentrate,

(2) restricting the volumetric rate during such draining to a rate of volumetric flow less than the volumetric rate of flow of concentrate being concurrently pumped to the dispensing head so that only a minor portion of the bypassed water is so drained simultaneously with pumping,

(3) subsequently draining a remaining and majority portion of the bypass water previously used for pumping

concentrate from the pump and not drained during pumping of concentrate from the pump, directly from the bypass line to a waste outlet after terminating dispensing and while simultaneously refilling the pump with concentrate, said first step of draining and said subsequent draining being a continuous single flow without interrruption therebetween, and, with none of the draining flow being dispensed into beverage previously dispensed, and

(4) retaining a prime of bypassed water in the bypass line by capillary action within a drain from the bypass line after completion of the subsequent draining and refilling of the pump.

4,181,243

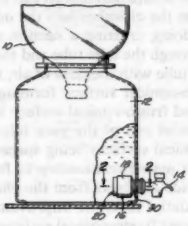
DEVICE FOR FILTERING BEVERAGES

Carl E. Frahm, 1428 Oak Meadow Rd., Arcadia, Calif. 91006

Filed Mar. 23, 1978, Ser. No. 889,359

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—189 **9 Claims**



1. An apparatus for filtering and dispensing a beverage at essentially atmospheric pressure from a reservoir comprising:

a spigot adapted to be mounted to the reservoir to dispense liquid therefrom, said spigot having a hollow member extending through an opening in the wall of the reservoir and having fastening means at the interior porton of the hollow member for fastening said spigot to said reservoir and an enlarged portion for positioning the spout of the spigot externally of the reservoir;

a filter receiving means adapted to receive a filter element positioned at the entrance of the spigot interior of the reservoir to filter the beverage passing through the spigot, said filter receiving means having fastening means complementary to the fastening means of the spigot and being of sufficient size and constructed and arranged to mount the spigot to the reservoir by the interaction between the fastening means of the spigot and of the filter receiving means, so that liquid to be dispensed from said spigot passes through a filter element mounted in said filter receiving means; and

a filter element having a complementary configuration to that of the opening of the filter receiving means, said filter receiving means and filter element being constructed and arranged so that the filter element can be push-fitted into the filter receiving means.

4,181,244

ICE CUBE DISPENSER WITH ROTOR FEED MEANS

Frank K. Karlovits, Arlington Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 784,226, Apr. 4, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,927

Int. Cl.[2] G01F *1/06*

U.S. Cl. 222—227 **9 Claims**

1. A dispenser for dispensing ice, comprising:

(a) bin means suitable for receiving and holding ice, said bin means including,

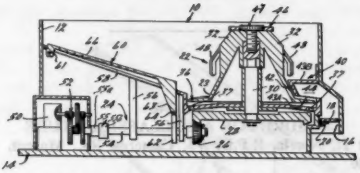
(i) means defining a discharge port for delivering ice therethrough,

(ii) scoop means operable to receive and direct the ice into said discharge port;

(b) rotor means rotatably mounted in said bin means, said rotor means having gripping means operative upon rotation of said rotor means to receive ice from said bin means and move said ice circumferentially therewith and into said scoop means, said rotor means including,

(i) hub means,

(ii) flange means extending generally radially outwardly from the base of said hub means;



(c) said scoop means including a deflecting member having an edge spaced closely adjacent and conforming to said hub means, and another portion spaced closely adjacent said gripping means, said deflecting member effective for channeling ice into said discharge port and preventing ice from bypassing said scoop means;

(d) drive means adapted for connection to a source of power and operable upon activation to rotate said rotor means, and

(e) activation means operable upon selective actuation by the user to activate said drive means.

4,181,245

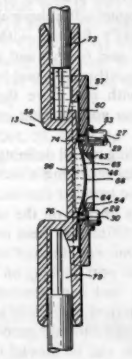
CASETTE FOR USE WITH AN I.V. INFUSION CONTROLLER

Scott T. Garrett, Highland Park; Lee K. Kulle, Mundelein, and William L. Rudzena, McHenry, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 17, 1978, Ser. No. 878,966

Int. Cl.[2] A61M *5/14*

U.S. Cl. 222—450 **23 Claims**



1. In a controlled volume administration set for liquids which defines a liquid flow path passing on one side of a flexible membrane positioned within a chamber-defining housing, and upstream and downstream valve apertures to permit valving members to alternatively and releasably block liquid flow through said flow path, said flexible membrane being elastomeric, the improvement comprising said flexible membrane

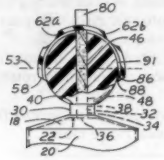
normally occupying a flat configuration in said chamber defined by the housing, said membrane being sufficiently resilient to bulge outwardly to and against one side of the chamber when said chamber is filled on the opposite side of the membrane with liquid at a gravity pressure head typical of that found in parenteral solution administration, to permit said liquid to fill the chamber, and channel means defined in the wall of said chamber adjacent the liquid-receiving side of said membrane extending between the upstream and downstream valve apertures for maintaining an open passageway between said valve apertures regardless of the configuration of said membrane.

4,181,246

CLOSURE FOR A COLLAPSIBLE TUBE

Gilbert H. Norris, R.F.D. #1, Cameron Rd., Mascot, Tenn. 37806

Filed Mar. 24, 1978, Ser. No. 889,955
Int. Cl.² B65D *47/06*
U.S. Cl. 222—548 **6 Claims**



1. A closure for a collapsible tube having malleable contents, said tube having a discharge end closed by a reinforcement member defining an opening therethrough, and a further end which is closed, said closure comprising:

a base member including means for mounting said base member to said reinforcement member of said collapsible tube, said means defining a bore therethrough, a substantially spherical portion attached to said mounting means and defining a substantially spherical surface, and an arcuate tongue integrally formed with the surface of said spherical portion, said tongue and said spherical portion defining a bore therethrough, said bore having a first end communicating with said bore through said mounting means and a further end opening on the outer surface of said tongue; and

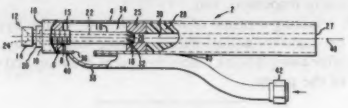
a cap member including a wall defining a substantially hemispherical cavity for receiving a section of said spherical portion of said base member therein, said wall of said cap member defining a groove on the side facing the cavity, said wall further defining at least one port therethrough which opens at one end thereof into said groove, the opposite end of said port opening on the outside surface of said cap member, said cap member being rotatably received on said spherical portion of said base member and guided by said tongue and said groove such that said port in said cap member can be moved into register with the end of said bore opening on said tongue surface for purposes of dispensing the contents of the tube upon collapsing a portion of the tube wall, said cap being rotatable about said spherical portion such that when the cap port and the end of the bore opening on said spherical member surfaces are rotated out of alignment the contents of the tube and portion of the tube contents disposed in the spherical portion of the base member are sealed.

4,181,247

YARN-HANDLING DEVICE

Andrew J. McFall, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1978, Ser. No. 873,678
Int. Cl.² B65H *17/32*
U.S. Cl. 226—97 **7 Claims**



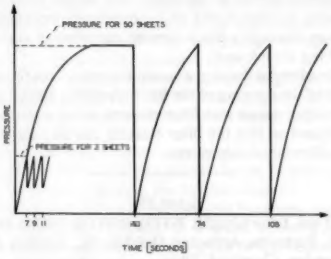
1. In a yarn-handling device of the type which includes a housing having an interior chamber, an inlet for supplying pressurized air to the chamber, a yarn inlet tube having an inlet end, an internal passage and an outlet end, a yarn outlet tube having an inlet end, an internal passage and an outlet end, both tubes being located in series on the same longitudinal axis of the device, and structure defining an exit from the chamber for directing air from the chamber into the inlet end of the outlet tube and in so doing creating a suction effect for aspirating yarn into and through the inlet tube and then into, through and out of the outlet tube with the flow of air, the structure including a first frusto-conical surface forming the exit from the chamber, a second frusto-conical surface located on the outer surface of the outlet end of the yarn inlet tube, the first and second frusto-conical surfaces being spaced from one another in coaxial, almost nested relationship to form an annular passage through which air flows from the chamber into the inlet end of the yarn outlet tube, the improvement comprising the angle of taper of said frusto-conical surfaces being between 22° and 32° to the longitudinal axis, the secondmentioned frusto-conical surface having a slant height and a plurality of flutes evenly spaced around the surface, the flutes being inclined at an angle of 20° to 40° to the slant height and the internal passage of the outlet tube being from 10 to 30 cm long and the passage tapering outwardly in the downstream direction at an angle of from 0°15′ to 0°50′, as measured from the longitudinal axis.

4,181,248

FIXED STAPLER HEAD

C. W. Spehrley, Jr., Quechee, Vt., assignor to Xerox Corporation, Stamford, Conn.

Filed May 15, 1978, Ser. No. 905,815
Int. Cl.² B27F *7/06*
U.S. Cl. 227—3 **17 Claims**



1. An apparatus for attaching a plurality of sheets to one another, including:

means for stapling the sheets to one another; means for controlling said stapling means; and

means for detecting the number of sheets being stapled to one another, said detecting means providing a signal to said controlling means for periodically energizing said

stapling means at a frequency dependent upon the number of sheets being stapled to one another.

13. An apparatus for attaching at least two articles to one another, including:

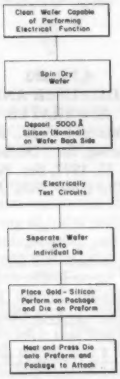
means for stapling the articles to each other; means for controlling said stapling means; and

means for detecting the combined thickness of the articles being stapled together, said detecting means providing a signal to said controlling means for periodically energizing said stapling means at a frequency dependent upon the combined thickness of the articles being stapled together.

4,181,249
EUTECTIC DIE ATTACHMENT METHOD FOR INTEGRATED CIRCUITS

Henry T. Peterson, Irvine, and Dennis H. Hawkins, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 26, 1977, Ser. No. 828,124
Int. Cl.² H01L *25/00*
U.S. Cl. 228—121 **8 Claims**


Clean Wafer Capable of Performing Electrical Function
Spin Dry Wafer
Deposit 5000 Å Silicon (Nominal) on Wafer Back Side
Electrically Test Circuits
Separate Wafer into Individual Die
Place Gold-Silicon Preform on Package and Die on Preform
Heat and Press Die onto Preform and Package to Attach

1. A method for attaching a die to a microcircuit supporting surface, in which the die comprises one of sapphire, silicon-on-sapphire, quartz and Spinel material and the surface comprises gold material which materials are not readily bondable and alloyable to and with each other, comprising the steps of selecting additional silicon and gold-silicon matter which are respectively adherable with the die and alloyable with the surface, placing the silicon matter on the die, and bonding the die and the surface together through the intermediary of the gold-silicon matter.

4,181,250
NEWSPAPER TUBE CLOSURE

Virdean N. Withrow, R.R. #1, Granville, Ill. 61326

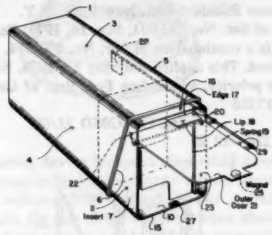
Filed Nov. 24, 1978, Ser. No. 963,923
Int. Cl.² A47G *29/12*
U.S. Cl. 232—44 **2 Claims**

1. A newspaper tube closure for a newspaper tube of substantially rectangular parallelepiped configuration having a bottom, a top spaced from and substantially parallel to the bottom and a pair of spaced substantially parallel sides joining the top and bottom and substantially perpendicular thereto, said newspaper tube having an open mouth, said newspaper tube closure comprising

an inner door pivotally mounted adjacent one of the sides of the newspaper tube at a predetermined distance from the open mouth thereof, said inner door being mounted for rotation perpendicularly to the top and bottom of said newspaper tube from a closed position substantially perpendicular to said top, bottom and sides of said newspaper tube to an open position at an angle between approximately 90° and 0° with said one of said sides, said inner door having an edge adjacent and parallel to said top of said newspaper tube and a lip extending substantially perpendicularly from said edge toward said open mouth of said newspaper tube;

spring biasing means abutting said inner door and urging it to its closed position;

an outer door pivotally mounted adjacent said top of said newspaper tube adjacent said open mouth of said newspaper tube between said inner door and said open mouth, said outer door being mounted for rotation perpendicularly to said sides of said newspaper tube from an open

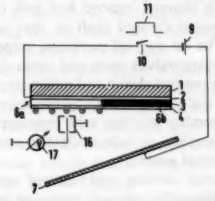


position substantially parallel to said top and bottom of said newspaper tube to a closed position substantially perpendicular to said top, bottom and sides of said newspaper tube, said outer door having a top edge adjacent and parallel to the top of said newspaper tube and an outer surface facing said open mouth of said newspaper tube and being restrained in its open position by the lip of said inner door abutting the outer surface of said outer door in the area of the top edge of said outer door when said inner door is in its closed position and being released to pivot to its closed position by the removal of said lip from said outer door when said inner door is in its open position whereby said outer door closes said newspaper tube in a weatherproof condition.

4,181,251
RECORD CARRIER WITH SAFETY FEATURES CAPABLE OF BEING CHECKED MECHANICALLY AND METHOD OF CHECKING SAID SAFETY

Wolfgang Becker, Munich, Fed. Rep. of Germany, assignor to G.A.O. Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Continuation of Ser. No. 690,865, May 28, 1976. This application Oct. 30, 1978, Ser. No. 955,770
Claims priority, application Austria, Jun. 10, 1975, 4422/75
Int. Cl.² G06K *7/08, 5/00, 19/06*
U.S. Cl. 235—451 **9 Claims**



1. A record carrier, such as an identification card, a credit card, and the like, with invisible safety features or information capable of being checked mechanically, said record carrier comprising, in combination, a card base; and an electrically

highly conductive layer and an electrically highly insulating layer disposed on said base with the interposition therebetween of a chemically homogeneous intermediate layer of photoconductor material consisting essentially of selenium or of selenium with additions of tellurium, the invisible safety features or information being introduced into said chemically homogeneous intermediate layer by varying the conductivity of selected areas of said intermediate layer to provide areas of different respective electrical conductivity.

4,181,252

THERMOSTATICALLY CONTROLLED MIXING VALVE FOR SANITARY DEVICES

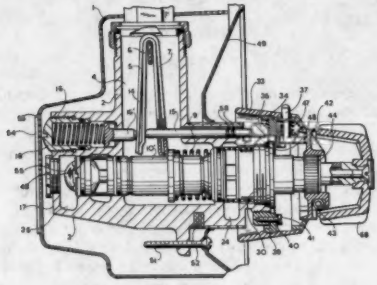
Werner Nolden, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Division of Ser. No. 833,931, Sep. 16, 1977, Pat. No. 4,121,761, which is a continuation of Ser. No. 677,574, Apr. 16, 1976, abandoned. This application May 17, 1978, Ser. No. 906,794

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1975, 2517355

Int. Cl.[2] G05D *23/00*

U.S. Cl. 236—12 R **1 Claim**



1. In a thermostatically controlled mixing valve, a cartridge adapted to be removably insertable into a valve body so as to provide either an individual or a central type thermostatically controlled mixing valve for use in sanitary installations, said valve comprising:

a valve body having an outlet opening, hot and cold water inlet openings, and having a first chamber in fluid communication with said outlet opening and a second chamber;

a temperature sensing and thermostat control assembly mounted in said first chamber;

said second chamber being selectively in fluid communication with said hot and cold water inlet openings, said second chamber being disposed normal to said first chamber so as to removably receive a cartridge in liquid tight engagement;

said cartridge comprising a volume control assembly which includes a rotatably mounted shaft extending along the axial length thereof, spaced hot and cold water valve means mounted on said shaft so that when said shaft is rotated to its on and off positions respectively, said hot and cold water valves open and close simultaneously;

a temperature control sleeve and collar assembly operatively coupled to and engaged with said temperature sensing and control assembly so that said temperature sensing and control assembly is independently operable with said volume control assembly;

said temperature sensing and control assembly having a U-shaped bimetallic element mounted in said first chamber; a first arm of said bimetallic element forming a stop for a first plunger; a second arm of said bimetallic element biasing against a shoulder on said temperature control sleeve;

a second plunger in said valve body which moves axially in response to a temperature setting of said temperature sensing and control assembly;

a second independent spring mounted in said valve body which is displaceable against the action of said first plunger to thereby cause said sleeve to shift to or away from the hot and cold water outlet openings of said cartridge in response to a temperature change in the water in said first chamber; and

said cartridge assembly having its external dimensions identical to the space in said second chamber so as to be insertable alternately, into said second chamber of said valve body of either an individual or central type thermostatically controlled mixing valve.

4,181,253

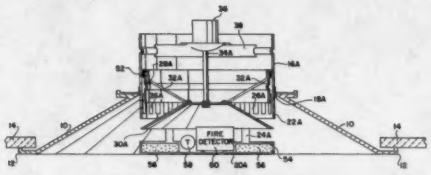
CEILING AIR DIFFUSER AND INDUCTION APPARATUS

Raymond S. Barlow, Plainville, Conn., assignor to Connor Engineering & Manufacturing, Inc., Danbury, Conn.

Filed Dec. 23, 1977, Ser. No. 863,705

Int. Cl.[2] F24F *7/00, 13/06*

U.S. Cl. 236—49 **27 Claims**



1. A combined ceiling air diffuser and induction apparatus comprising a housing,

the lower portion of said housing comprising outwardly flared side walls having lower wall edges which at least partially define the lower portion of the diffuser,

said housing including a vertical wall portion having walls extending vertically upwardly from the upper edges of said flared side walls and forming a vertical extension of said housing,

the upper end of said vertical wall portion being adapted to receive primary air from an air supply source,

said vertical portion including a lower extension extending into said lower portion,

said extension including vertically elongated horizontally oriented orifice openings at horizontally spaced positions therein,

a damper device comprising an open-ended vertically oriented sleeve member,

said damper device being adjustably positionable at different elevation positions to thereby cause said sleeve member to have different elevation positions within said vertical wall portion,

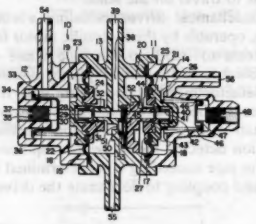
said damper device including a damper plate member arranged generally horizontally within the diffuser,

at least one of said damper device members being operable as the vertical position of said damper device is varied to vary the open area of said elongated orifice openings by variably masking and unmasking said openings.

4,181,254
PNEUMATICALLY AND TEMPERATURE CONTROLLED VALVE CONSTRUCTION

Naruse Yoshihiro, Kariya; Ohumi Takeharu; Suzuki Yukio, both of Toyota; Harada Toshiro, Okazaki, and Okuno Takao, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan, part interest to each

Filed Oct. 25, 1977, Ser. No. 844,961
Claims priority, application Japan, Oct. 22, 1976, 51/142344[U]
Int. Cl.[2] G05D *23/10*
U.S. Cl. 236—87 9 Claims



1. A pneumatic pressure and temperature responsive valve mechanism for use in interconnecting a pneumatic source to a pneumatically operated device, said valve mechanism comprising:

a housing formed of first and second side housing parts and a middle housing part connected therebetween;

a first diaphragm having an outer periphery thereof clamped between said first side housing part and said middle housing part such that said first diaphragm and said first housing part define a first chamber;

a second diaphragm having an outer periphery thereof clamped between said second side housing part and said middle housing part such that said second diaphragm and said second housing part define a second chamber;

said first and second diaphragms and said middle housing part defining a third chamber;

a first vacuum passage for communicating said first chamber with a first vacuum supply;

a second vacuum passage for communicating said second chamber with a second vacuum supply;

an inlet for communicating said third chamber with said pneumatic source;

an outlet for communicating said third chamber with said pneumatically operating device, said outlet having first, second and third ports for communicating with said third chamber;

a first vacuum operated valve arranged to normally close said first port, said first valve being operably connected to said first diaphragm such that said first valve opens in response to the vacuum pressure in said first chamber being sufficiently less than the pressure in said third chamber to deflect said first diaphragm, to communicate said inlet with said outlet;

a second vacuum operated valve arranged to normally close said second port, said second valve being operably connected to said second diaphragm such that said valve opens in response to the vacuum pressure in said second chamber being sufficiently less than the pressure in said third chamber to deflect said second diaphragm, to communicate said inlet with said outlet; and

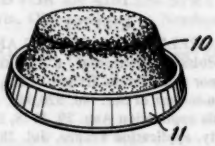
a bimetallic third valve arranged to normally close said third port, said third valve being arranged to be acted upon by pneumatic temperature in said third chamber so as to be deflected to an open position in response to such temperature reaching a selected value, to communicate said inlet with said outlet;

said first, second and third valves being arranged to open and close independently of one another such that any of said valves may be open regardless of whether either of the other two valves is open.

4,181,255
ODOR FILTERING DEVICE

J. George Cort, Port Washington, N.Y., assignor to CDC Chemical Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,983
Int. Cl.[2] A61L *9/04*
U.S. Cl. 239—54 18 Claims

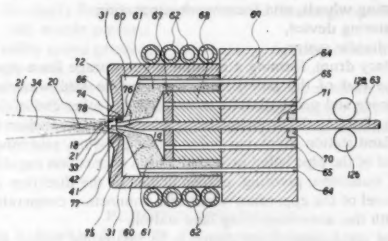


1. An odor filtering device for space dispensing a volatile oil comprising a substantially rigid substrate means having voids of substantially uniform size throughout for entraining an essential oil therein, the size of the voids between about 10 and 150 microns in cross-section and a volatile essential oil entrained in the substrate, the oil comprising a mixture of a malodor counteractant capable of producing reversible selective anosmia and a perfume accelerator, whereby said essential oil is volatilized to the space at a predetermined rate.

4,181,256
METAL MELT-SPRAYING METHOD AND EQUIPMENT

Ryoichi Kasagi, No. 5-6, Minamitsukaguchi-cho, 1-chome, Amagasaki-shi, Hyogo-ken, Japan

Filed May 15, 1978, Ser. No. 906,262
Claims priority, application Japan, May 20, 1977, 52/59065
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—81 1 Claim



1. A metal spraying apparatus for producing a deposited film without shrinkage or distortion, said apparatus comprising:

(a) an outer casing nozzle, said nozzle having a frustro-conical shaped hole formed in one wall;

(b) an inner nozzle means positioned within said outer casing nozzle, said inner nozzle means extending into said frustro-conical shaped hole wherein a small annular gap is formed between said hole and said inner nozzle means;

(c) a metal wire having an end positioned in said inner nozzle means, said inner nozzle means being positioned between said metal wire and said gap;

(d) a high frequency electric coil positioned on the exterior of said outer nozzle, said coil being capable of acting in conjunction with said inner nozzle such that said inner nozzle acts as an electromagnetic core surrounded by said coil, such that said coil and said core form a heater means, positioned with respect to said metal wire for heating an

end of said metal wire in said inner nozzle means, said heater means being formed such that said metal wire is melted by energy directed to said end of said wire by said inner nozzle, thereby forming droplets;

(e) high pressure air jet means for jetting air under high pressure through said gap, said jet means being positioned so as to direct pressurized air through said apparatus such that said pressurized air is directed through an area wherein said pressurized air is free from exposure to any concentration of said directed energy of said inner nozzle so that said air remains unheated as it passes through said apparatus.

4,181,257

SELF-PROPELLING WATERING APPARATUS

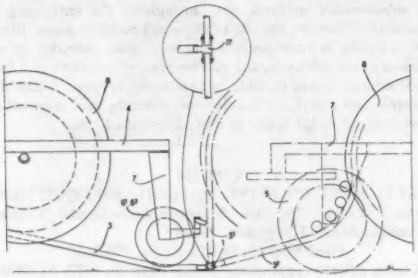
Jean-Claude Moisan, Montpezat d'Agenais par Prayssas, France, assignor to Di Palma Irrigation S.A., Cavalle, France

Continuation-in-part of Ser. No. 820,042, Jul. 28, 1977, abandoned. This application Aug. 29, 1978, Ser. No. 937,861

Claims priority, application France, Jul. 28, 1976, 76 02302; Jul. 22, 1977, 77 22509

Int. Cl.[2] B05B *3/18*

U.S. Cl. 239—183 **41 Claims**



1. A watering apparatus comprising a framework having supporting wheels, said framework supporting:

a watering device,

a hydraulic motor,

a rotary drum, forming a multiple layer storage for a pipe, one end of the pipe being connected to said watering device and said hydraulic motor, and the other end of the pipe leaving the drum and being adapted for connection to a land station supplying water under pressure, said other end of the pipe being provided with a connection capable of transverse pivoting, perpendicular to the direction of travel of the apparatus, when said connection cooperates with the water supplying land station,

a first mechanical drive operable by hydraulic motor for driving certain of the supporting wheels, to cause said apparatus to travel on the land,

a second mechanical drive, including slip coupling means, operable by the hydraulic motor for driving said rotary drum to wind up the pipe while the apparatus travels towards said water-supplying station,

said first and second mechanical drives having such chosen transmission ratios that, with the effect of the slip coupling means, the pipe can wind up in successive layers with a small tension when the apparatus advances towards the water supplying station,

a rocking member disposed beneath the apparatus in the vicinity of the drum, said rocking member being arranged to be rocked by the pipe when the apparatus passes above said water supplying station on the land, said rocking member controlling disconnection of said slip coupling means, whereby after complete winding of the pipe on the drum and arrival at the water supply station, the apparatus can continue watering while advancing in the same direction, with the pipe being now unwound.

23. A watering apparatus comprising a framework having supporting wheels, said framework supporting:

a watering device,

a hydraulic motor,

a rotary drum, forming a multiple layer storage for a pipe, one end of the pipe being connected to said watering device and said hydraulic motor, and the other end of the pipe leaving the drum and being adapted for connection to a land station, supplying water under pressure,

a first mechanical drive operable by the hydraulic motor for driving certain of the supporting wheels, to cause said apparatus to travel on the land,

a second mechanical drive, including a controllable slip coupling, operable by the hydraulic motor for driving said rotary drum to wind up the pipe while the apparatus travels towards said water-supplying station, and

a tension detector means, cooperating with the pipe on the path thereof when leaving the drum towards the water-supply station, to detect the tension exerted on the pipe, said tension detector means being responsive to the tension of the pipe exceeding a predetermined value by controlling said coupling to decelerate the drive of the drum.

4,181,258

SPRAYER FOR REPAIRING REFRACTORY LINING

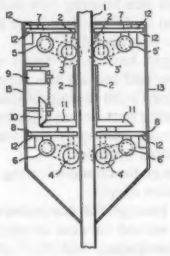
Minoru Ogawa, Nagoya, Japan, assignor to Quigley Company, Inc., New York, N.Y.

Filed Mar. 21, 1978, Ser. No. 888,716

Claims priority, application Japan, Mar. 23, 1977, 52-031164

Int. Cl.[2] B05B *13/06*; B05C *7/02*

U.S. Cl. 239—186 **8 Claims**



1. A spraying device for repairing a refractory lining, which comprises:

a nozzle pipe having a first end for receiving a slurry of a refractory repairing material and a second end at which a nozzle is to be fitted for spraying said slurry;

a stationary housing disposed about said nozzle pipe intermediate said first and second ends, said nozzle pipe being both rotatable about its axis and axially movable forward and backward relative to said housing;

a first turntable rotatably supported by and within said housing, said turntable being coaxial with said nozzle pipe and having a central opening between its two opposed major faces through which said nozzle pipe freely passes;

first pipe driving means mounted on one of said major faces of said turntable and engaged with said nozzle pipe, said driving means supporting said nozzle pipe relative to said housing and being actuable to drive said nozzle pipe in either axial direction of said nozzle pipe relative to said housing;

first actuating means secured to said one face of said turntable for actuating said driving means;

pipe rotating means comprising a first gear intermeshed with a second gear, said first gear being coaxially fixed to the other of said major faces of said turntable and having a

central opening through which said nozzle pipe freely passes, said second gear having a drive shaft supported for rotation by said housing; and

second actuating means secured to said housing for rotating said drive shaft to cause said second gear to rotate said first gear about said nozzle pipe axis together with said turntable carrying said driving means and said first actuating means, whereby said nozzle pipe and said turntable rotate in unison.

4,181,259

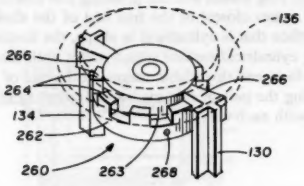
ROTARY SPRINKLER IMPACT ARM SPRING ADJUSTMENT

H. Curtis Ridgway, 7777 Manderville, Apt. 151, Dallas, Tex. 75231

Division of Ser. No. 889,439, Mar. 23, 1978, which is a division of Ser. No. 759,727, Jan. 17, 1977, Pat. No. 4,103,828. This application Jan. 29, 1979, Ser. No. 7,312

Int. Cl.² B05B *3/14*

U.S. Cl. 239—206 **6 Claims**



1. An impact sprinkler having a laterally directed nozzle cooperating with an impact arm comprising:

a shaft extending above the nozzle on which the impact arm is journaled;

a pair of arms extending from the nozzle on opposite sides of said shaft;

a top place connecting the ends of said arms remote from the nozzle;

a helical spring surrounding said shaft secured at the lower end to the impact arm; and

a ring member receiving the upper end of the spring and having a castellated flange therearound for mating with corresponding ribs formed in said top plate, said ring being manually adjustable relative to the cage for varying the force applied by said spring to the impact arm.

4,181,260

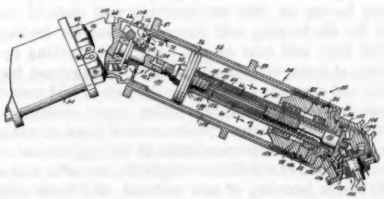
HYDRAULIC ACTUATION RING

Dudley O. Nash, Forest Park, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 17, 1977, Ser. No. 778,476

Int. Cl.² B64C *15/06*

U.S. Cl. 239—265.39 **29 Claims**



1. An actuator ring comprising:

a plurality of telescoping hydraulic actuators connected in the shape of a polygon, each actuator including a reciprocative piston responsive to fluid pressure, a structural casing surrounding said piston and connected thereto by means of a piston rod, and a hydraulic cylinder telescopically received within said structural casing and within which the piston reciprocates;

means for supplying pressurized fluid to said pistons; and

means for synchronizing the reciprocation of said piston within their respective actuators to vary the length of the actuators and the area enclosed by the polygonal actuator ring.

4,181,261

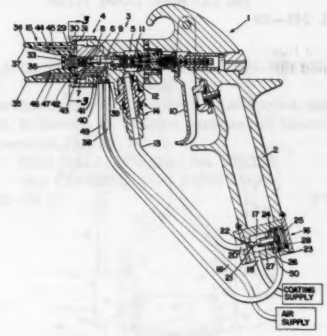
SAFETY GUARD FOR AN AIRLESS SPRAY NOZZLE

Gerald Crum, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Mar. 17, 1978, Ser. No. 887,689

Int. Cl.² B05B *11/00*

U.S. Cl. 239—288.5 **16 Claims**



1. An airless spray coating apparatus comprising:

a nozzle portion having a discharge opening effective to discharge fluid therefrom;

a hydraulic conduit communicating with said nozzle portion to supply fluid under pressure to said discharge opening of said nozzle portion;

a safety guard proximate the discharge opening of the nozzle portion;

control means responsive to a fluid control medium supply and effective to disable said pressurized supply of fluid to said nozzle portion when said safety guard is significantly broken.

4,181,262

PURGING APPARATUS

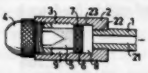
Curt A. Bjorklund, Box 99, Ulricehamn, Sweden

Filed Dec. 21, 1977, Ser. No. 862,817

Claims priority, application Sweden, Jan. 7, 1977, 7700115

Int. Cl.² F23D *15/00*

U.S. Cl. 239—404 **32 Claims**



1. Purging apparatus for removing air bubbles from a liquid flow conduit comprising a hollow holder, a nozzle tip element mounted at one end of said holder, an inlet channel opening into the other end of said holder, a chamber between the opposite ends of the holder, and a filter in said chamber disposed in the liquid path from said chamber to said tip element, the

improvement comprising means in the chamber for atomizing liquid and entraining air in its path from said inlet channel to said tip element, said means including a partitioning means comprising a disc dividing said chamber into a rear part and a front part, and a restricted flow passage adjacent the wall of said front part interconnecting said rear and front parts of the chamber, said restricted passage increasing the speed of the flow of liquid passing through the passage and adjacent the wall of said front part to entrain air bubbles in said holder into the liquid flow and atomize the liquid prior to the passage of said liquid through said filter and said nozzle tip element.

4,181,263

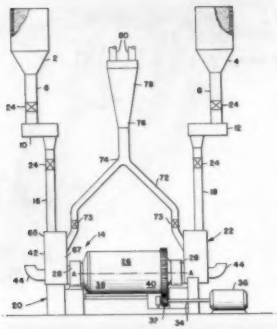
METHOD OF PULVERIZING

William D. Stevens, North Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 838,620, Oct. 3, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 944,227

Int. Cl.[2] B02C *17/06, 17/00*

U.S. Cl. 241—19 **6 Claims**



1. A method of pulverizing comprising the steps of:
(a) feeding a first solids feedstock to a first pulverizing section;
(b) feeding a second solids feedstock to a second pulverizing section;
(c) pulverizing said first and second solids feedstocks in said first and second pulverizing sections, respectively;
(d) passing pulverized solids from said first and second pulverizing sections to first and second classifying means respectively for separating of oversized solids out of said pulverized solids;
(e) recycling said separated oversized solids from said first and second classifying means to said first and second pulverizing sections, respectively;
(f) passing said pulverized first and second solids from respective first and second classifying means to mixing means;
(g) mixing said pulverized first and second solids in said mixing means; and
(h) regulating the rate of feeding said first and second solids to respective first and second pulverizing sections in order to obtain a desired blend of said mixture of first and second pulverized solids feedstock in said mixing means.

4,181,264

CENTRIFUGALLY OR STATIC CAST GRINDING ROLLS

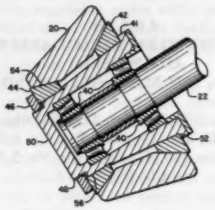
John J. Halloran, Jr., East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 24, 1978, Ser. No. 963,668

Int. Cl.[2] B02C *15/00*

U.S. Cl. 241—117 **1 Claim**

1. In a grinding mill, a grinding ring, a grinding roll which coacts with the ring to perform the grinding action, means for imparting relative rotation between the grinding ring and grinding roll, a shaft, a journal means surrounding the shaft, a housing surrounding the journal means, means for securing the grinding roll to the housing, said means including ring means at both ends of the roll which encircle the housing, the ring means being wedge-shaped in cross-section, the roll having a tapered portion at each end thereof which coacts with the wedge-shaped ring means, the shaft having a free end over



which the ring means and the grinding roll can be assembled, the ring means closest to the free end of the shaft having an inner surface that is cylindrical in shape, the housing having a coacting cylindrical surface which mates with the ring means inner surface, and threadable means on the end of the housing for holding the pair of ring means and grinding roll in locked contact with each other.

4,181,265

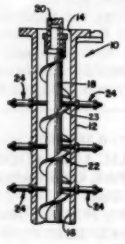
MATERIAL PROCESSING APPARATUS AND BREAKER ASSEMBLY UTILIZED THEREIN

Simon Young, Rte. 1, Ada, Okla. 74865, and L. B. Rue, Rte. 3, Ada, Okla. 74820

Continuation-in-part of Ser. No. 768,866, Feb. 15, 1977, abandoned. This application Feb. 16, 1978, Ser. No. 878,426

Int. Cl.[2] B02C *18/30, 19/22*

U.S. Cl. 241—257 R **6 Claims**



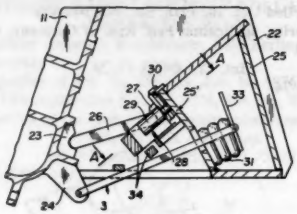
1. An apparatus for breaking up material, comprising a housing having an inlet for receiving said material and an outlet for discharging said material, means for feeding the material from said inlet to said outlet and breaking up said material, at least one elongated member supported by said housing and normally extending in the path of said material as it passes from said inlet to said outlet, means associated with said member for applying a predetermined force to said member in a first direction perpendicular to the longitudinal axis of said housing and of a sufficient magnitude to enable said member to inhibit jamming of said material, said force applying means permitting said member to retract from said path in a direction opposite to said first direction in response to a force acting on said member by said material in excess of said predetermined force, and to return to said path after release of said force by said material.

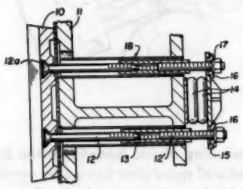
4,181,266

PNEUMATICALLY ASSISTED MAINTAINING AND SETTING SYSTEMS FOR THE JAW-PLATE OF A JAW CRUSHER

Jean-Pierre Georget, Denain, and Guy Doleans, Aulnoy les Valenciennes, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Dec. 27, 1977, Ser. No. 864,710
Claims priority, application France, Dec. 24, 1976, 76 39032
Int. Cl.[2] B02C *1/04*
U.S. Cl. 241—264 **10 Claims**





1. A jaw crusher which comprises a frame having two side plates and a crossbeam extending therebetween and affixed thereto, a jaw-plate carrier supported for swinging movement on the frame, a jaw-plate replaceably mounted on the carrier, a system for maintaining the jaw-plate on the carrier, a system for setting the position of the carrier and the jaw-plate mounted thereon, the setting system including a slide block adjustably mounted on the crossbeam and a toggle connecting the carrier to the crossbeam, the jaw-plate maintaining system comprising resilient tension means pressing the jaw-plate against the carrier and means for moving the jaw-plate away from the carrier for enabling the replacement of the jaw-plate on the carrier, and the setting system comprising resilient tension means pressing the slide block against the crossbeam and means for moving the slide block away from the crossbeam for enabling the adjustment of the slide block on the crossbeam, at least one of the systems comprising a deflatable air-filled cushion means incorporated in the resilient tension means and the moving means in the one system comprising the deflatable air-filled cushion means being operable after deflation of the cushion means.

4,181,267

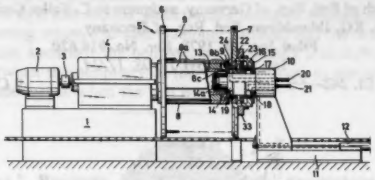
ARRANGEMENT FOR COMPACT WINDING OF A CONTINUOUSLY FED WIRE

Werner Schmitz-Steger, Barkhovenhohe 27, 4300 Essen 16, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,788
Int. Cl.[2] B65H *65/00, 75/28*
U.S. Cl. 242—25 R **14 Claims**

1. An arrangement for winding a continuously fed wire, comprising a rotary spool having a core and a flange at one end of the core and spaced from said end of the core to form a wire receiving groove between the core and said flange;

means connecting said core and flange for joint rotation about an axis of the core, and wire clamping means movable in the axial direction and into the groove to clamp the



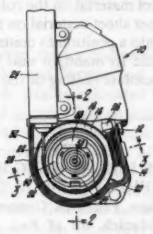
wire introduced into the groove tangentially of the core and groove.

4,181,268

DRIVE AND STORAGE DRUM FOR AN ANTENNA CABLE

David T. Carolus; Ralph W. Edwards, both of Dayton, and John R. Powell, Bellbrook, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1978, Ser. No. 938,752
Int. Cl.[2] H01Q *1/10*; B65H *75/34*
U.S. Cl. 242—54 A **2 Claims**



1. A drive and cable storage assembly for a power driven telescoping vehicle antenna comprising; a drive cup having a frusto-conical inner surface, a flat base surface, support means extending from said base surface spaced from and encircled by said inner surface, a drive tang extending from said base surface intermediate said support means and said inner surface, and a plurality of retainer tangs integral with said support means extending radially therefrom toward said inner surface and being spaced from said base surface; a resilient member encircling said drive tang; and a driven cup having a frusto-conical outer surface generally parallel to said inner surface and spaced therefrom, a flat base portion, driven slot means having side walls extending from said base portion and being in alignment with said drive tang and said resilient member for accepting drive forces from said drive cup through said resilient member, retainer slots formed in said base portion alignable with said retainer tangs when said resilient member is compressed a predetermined amount in one direction of relative rotation between said drive tang and driven slot means and the retainer slots being maintained misaligned with said retainer tangs by said resilient member during normal operation to prevent axial separation of said drive cup and said driven cup, and antenna cable attaching slot means formed in said outer surface of said driven cup for providing a drive connection between the driven cup and an antenna cable, said space between said inner and outer surfaces providing storage space for the antenna cable when the antenna is retracted.

4,181,269

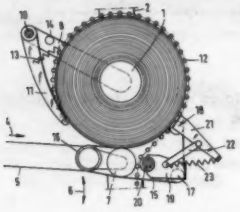
REELING DEVICE FOR VENEER BAND

Otto Ketteler, Bad Iburg, and Hans-Peter Gielsok, Mettingen, both of Fed. Rep. of Germany, assignors to C. Keller GmbH u. Co. KG, Ibbenbüren, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,620

Int. Cl.[2] B65H *17/08, 17/14*

U.S. Cl. 242—65 **9 Claims**



1. Apparatus for reeling sheet material on a roll, comprising means for rotatably mounting said roll, first pivoting arms pivotably mounted for rotation about an axis coincident with the axis of the roll, second pivoting arms having one end portion pivotably mounted on said first pivoting arms, chain pressing means suspended from the other end portion of said second pivoting arms, said first pivoting arms being pivotal between an inoperable position which permits the roll to be mounted or removed from said mounting means and an operable position in which said chain pressing means extends about the roll to contact the veneer sheet material on the roll and thereby facilitate reeling of the veneer sheet material on the roll, and endless band means movable into a position to contact the veneer sheet material on the roll and to maintain said contact during the reeling operation to facilitate reeling of the veneer sheet material on the roll.

4,181,270

APPARATUS FOR WINDING WEBS OF PHOTOGRAPHIC PAPER OF THE LIKE

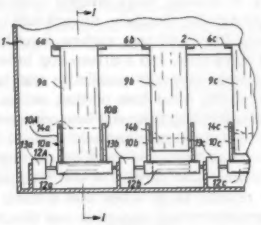
Erwin Laar, Taufkirchen; Friedrich Ganser, Feldkirchen, and Thomas Hammer, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 919,288

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729646

Int. Cl.[2] B65H *17/08, 59/00*

U.S. Cl. 242—66 **14 Claims**



1. Apparatus for winding several discrete webs on flanged takeup reels, particularly for winding webs of developed photographic paper, comprising means for advancing the webs toward the respective reels at a first speed; and independent drive means for the flanges of each of said reels, each of said drive means including means for varying the peripheral speed of the flanges of the respective reels as a function of changes of the diameter of convoluted web material thereon and a plurality of substantially parallel supporting rollers for the flanges of the respective reels, each of said speed varying means comprising a variable speed prime mover for at least one of said supporting rollers.

4,181,271

SPOOL WITH EXTERNAL HOOKS FOR WINDING MATERIAL IN THE FORM OF TAPE

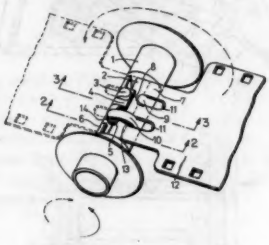
Achim Kluczynski, Overath, and Erik Altmann, Muehlheim, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,398

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2745981

Int. Cl.[2] B65H *75/28*

U.S. Cl. 242—74 **7 Claims**



1. A spool for winding elastic material in the form of tape comprising a cylindrical spool core having an opening therein, one or more catch hooks with counter hooks formed on and in the said opening and one or more pairs of opposite retaining elements for hooking the tape, which has apertures therein, on to the spool while the spool is in rotation, in such a manner that if the direction of winding of the spool is reversed after the tape has been hooked into position, the tape remains firmly and securely connected to the spool.

4,181,272

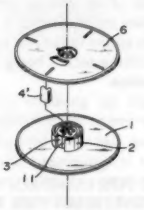
TAPE CASSETTE REEL

Haruo Shiba, and Masatoshi Okamura, both of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,959

Int. Cl.[2] B65H *75/28*

U.S. Cl. 242—74.1 **3 Claims**



1. A tape cassette reel assembly comprising:

a hub having a groove portion including a cavity formed on the bottom of the groove portion;

a clamp for fitting to said groove portion of said hub and for clamping a tape thereto, said clamp including a first rib member;

a pair of legs extended from both ends of the first rib member;

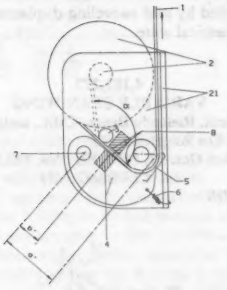
a second rib member which is fitted between the legs; and
a projected part formed on the second rib member;
said clamp being fitted to said groove portion of said hub so as to fit said projected part formed on the second rib member to said cavity formed on the bottom of the groove portion of the hub wherein said groove portion includes a first and second recess portion and said legs extending from the first rib member each have a hook portion which is fitted to said recesses in said groove portion of the hub.

4,181,273

AUTOMATIC RAPID LOCK BELT ROLL-UP CLAMP FOR SAFETY BELTS

Heinz-Dieter Adomeit, Knesbeckstr, 1000 Berlin 12, Fed. Rep. of Germany

Continuation of Ser. No. 696,001, Jun. 14, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,539
The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.2 **3 Claims**



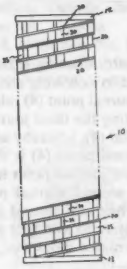
1. A vehicle safety belt retractor, comprising:
a. a housing;
b. a winding drum being rotatably mounted on said housing;
c. belt means attached to said winding drum for protraction and retraction with respect thereto;
d. clamp means for clamping said belt to prevent sudden protraction thereof, said clamp means including:
(i) a first fixed planar clamping surface;
(ii) a lever pivotally mounted at one end thereof; and
(iii) a second displaceable planar clamping surface carried by the intermediate portion of said lever for movement from a rest position toward said fixed clamping surface to clamp the belt therebetween;
e. resilient means coupled to said lever for biasing said lever for movement about its pivot in a direction to urge the second clamping surface carried by said lever away from said first clamping surface;
f. first guide means mounted adjacent said one end of said lever for guiding said belt means;
g. second, displaceable, guide means carried by the other end of said lever for entrainment of said belt means thereabout, and operating in response to preselected abnormal tension of said belt to pivot said lever and thereby move said second clamping surface toward said first clamping surface;
said belt means normally extending off said winding drum to said first guide means, past said pivot, thence between said clamping surfaces without contact therewith and thence over said second guide means whereby in normal operation the retractor allows always free winding and unwinding of the belt between said clamping surfaces without contact therewith, but where a predetermined abnormal tension on the belt applies a force to said lever via the second guide means to actuate said lever into its clamping position against the bias of said resilient means in a substantially normal direction with no wedging action, said planar clamping surfaces being substantially parallel to the plane of the web at the point of contact therewith;
h. said first and second guide means being so located on the housing relative to said clamping surfaces and the winding drum, such that the belt follows essentially a straight path between the periphery of the winding drum to the second guide means when the belt is retracted.

4,181,274

DYE TUBE

Robert L. Burchette, Jr., 151 Fernwood Dr., Spartanburg, S.C. 29302

Filed Oct. 22, 1976, Ser. No. 734,830
Int. Cl.[2] B65H *75/20*
U.S. Cl. 242—118.11 **18 Claims**



1. An improved yarn carrier comprising:
(a) a pair of annular end flanges; and
(b) an intermediate structure located between said annular end flanges, said intermediate structure comprising at least one flexible member extending generally transverse to the length of the carrier, a plurality of first non-deformable rigid members provided along the length of the intermediate structure and extending generally axially to the length of the carrier, said first non-deformable rigid members being spaced apart from other first non-deformable members in all directions, and a plurality of second initially rigid members disposed among said first rigid members and extending generally axially to the length of the carrier, said members being united to define an initially rigid structure having an open network for passage of dye liquor therethrough, said second initially rigid members having a width dimension at an outer edge of said carrier less than a depth dimension transverse to the length of said carrier whereby upon receipt of a predetermined amount of axial force on said carrier, said second initially rigid members deform in a direction generally circumferentially with respect to said carrier permitting partial collapse of said carrier.

4,181,275

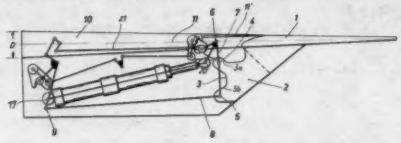
APPARATUS FOR OPERATING FLAP MEANS SECURED TO THE WING OF AN AIRCRAFT

Gunther Moelter, Ottobrunn; Hermann Mueller, and Ruediger Kunz, both of Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 909,624
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725632
Int. Cl.[2] B64C *9/02, 9/10*
U.S. Cl. 244—213 **4 Claims**

1. An apparatus for securing and driving flap means (1) connected to an aircraft wing (10), comprising coupling means

(2) secured to said flap means (1) on the downwardly facing side of the flap means, said coupling means having an edge (3) facing toward said wing (10), a first journal point (6) secured in a fixed position to said wing (10), a second journal point (4) in a fixed position on said coupling means (2), a third journal point (5) in a fixed position on said coupling means (2), lever rod means (7) pivotally connecting said first journal point (6) to said second journal point (4) whereby a toggle joint is formed in which said second journal point is located intermediate the first and third journal points and whereby said three journal points are located substantially in vertical alignment when said flap means (1) extend substantially horizontally in



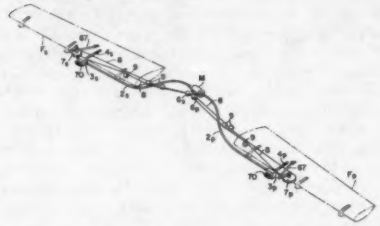
alignment with said aircraft wing (1), and drive means (8,18) operatively connected to said wing and to said toggle joint for rotating the second journal point (4) relative to the first journal point (6) and for rotating the third journal point (5) relative to the second journal point (4), whereby said flap means are lifted when the second journal point (4) is maintained substantially stationary and the third journal point is rotated counterclockwise relative to said second journal point, whereas the flap means are lowered when said second journal point is rotated counterclockwise relative to said first journal point while the third journal point is rotated clockwise relative to said second journal point.

4,181,276

SAFETY DEVICE IN AIRCRAFT HIGH-LIFT DEVICE

Yasuyuki Kogure, and Yoneo Okada, both of Utsunomiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,027
Claims priority, application Japan, Aug. 10, 1977, 52/95721
Int. Cl.[2] B64C *9/00*
U.S. Cl. 244—215 **7 Claims**



1. In a high-lift device provided in an aircraft with a main wing and comprising movable starboard and port high-lift surfaces installed with respect to the main wing and driving means for operating the high-lift surfaces synchronously, the combination therewith of a safety device comprising:

a swivel frame pivotally supported at the midpoint thereof by a fixed pivot pin on the aircraft at a position between the starboard and port high-lift surfaces;

first rotation transmitting means comprising a pair of inboard wheel means rotatably supported by respective parallel support shafts on the swivel frame at spaced-apart positions on opposite sides of the fixed pivot pin;

second rotation transmitting means comprising starboard and port units respectively installed in the wing on symmetrically opposite sides of the aircraft in the vicinity of the high-lift surfaces, each unit comprising an outboard wheel rotatably supported by the wing and movement transmitting means for transmitting movements of the corresponding high-lift surface to the outboard wheel thereby to impart rotation to the outboard wheel in accordance with the degree of movement of the high-lift surface;

an endless flexible connector stretched around the outboard wheel means and the inboard wheels in the figure of the Arabic numeral eight, being crossed in the region between the pair of inboard wheel means;

the swivel frame, the first and second rotation transmitting means, and the flexible connected constituting an intercoupling mechanism which operates to mechanically intercouple the starboard and port high-lift surfaces and to synchronize the movements thereof and normally operates in a state of equilibrium wherein the swivel frame is in equilibrium with no moment urging it to swivel when the high-lift device is operating in a symmetrical state, but which continues to intercouple the high-lift surfaces under an unbalanced state therein the swivel frame is biased to undergo a swiveling displacement when the high-lift device operates in an asymmetrical state; and

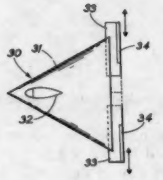
means activated by said swiveling displacement for sensing the asymmetrical state.

4,181,277

VARIABLE SPAN WING

Heinz A. Gerhardt, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 27, 1977, Ser. No. 845,864
Int. Cl.[2] B64C *3/54*
U.S. Cl. 244—218 **3 Claims**



1. In combination with an aircraft having stationary main wings and a fuselage, partially external movable wing segments mounted on the trailing edges of said main wings, said wing segments being slidably movable along the outer portion of the main wing trailing edges from positions wherein the inboard ends thereof are recessed within said fuselage with the outboard ends thereof coterminus with the tips of said main wings, to positions wherein the inboard ends thereof are extended out of said fuselage with the outboard ends extending beyond the tips of said main wings, power means for extending and retracting said wing segments, trailing edge flaps movably mounted on the trailing edges of said movable wing segments, and power means for operating said flaps.

4,181,278

RAILROAD INTERLOCKING SIGNAL SYSTEM WITH INSULATED JOINT FAILURE AND OVERRUN PROTECTION

Robert D. Pascoe, Upper St. Clair Township, Allegheny County, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

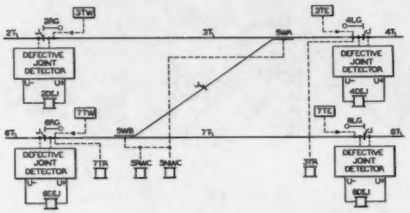
Filed Jul. 28, 1978, Ser. No. 928,946
Int. Cl.[2] B61L *19/16, 21/06*
U.S. Cl. 246—34 R **9 Claims**

1. In combination with a railroad interlocking control system, which includes an insulated joint in each rail at each

entrance location into the interlocking layout, to electrically separate the track sections within the layout from the adjoining approach track sections, and signal transmitters coupled to the rails and actuated by the control system for authorizing train movements along a selected route when fully established and nonoccupied by another train,

(a) a detection means coupled to the rails at each entrance location and responsive to the condition of the associated pair of insulated joints for operating to a first or a second condition, respectively, as said associated joints are insulating the adjoining rails or one has failed so that an electrical path exists between the adjoining rails,

(1) each detection means also responsive to the passage of a train by the associated joints for intermittently operating to its second condition, and



(b) lockout means operable to a first and a second position and coupled for inhibiting the operation of said signal transmitters when in its second position,

(c) said lockout means normally controlled by all said detection means for holding in its first position when each said detection means occupies its first condition,

(1) said lockout means further controlled by said interlocking control system for holding in its first position when a detection means detects the authorized passage of a train along an established route,

(2) the detection of the unauthorized passage of a train or the failure of an associated insulated joint by a detection means operating said lockout means to its second position to inhibit the transmission of any signal by said transmitters during the detected fault condition.

4,181,279

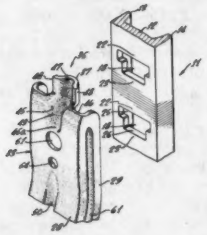
CABLE SUPPORT STRUCTURE

Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 2404 Colt Rd., Rancho Palos Verdes, Calif. 90274

Filed Sep. 12, 1977, Ser. No. 832,406

Int. Cl.² F16L *3/00*

U.S. Cl. 248—70 **20 Claims**



1. A one piece-support bracket for electrical conductors, cables and other loads, said bracket being adapted to be removably mounted on a T-slotted channel-shaped downcomer in an electrical vault or passage, said bracket comprising:

(a) an enlongated support portion, and

(b) a connector element provided at one end of said support portion,

said connector element comprising a protuberance formed in said support portion by recessing one side thereof,

said protuberance having a bottom wall adapted to seat on the lower wall of a T-slot in said downcomer,

said proturberance also having side walls which strengthen greatly said bottom wall thereby said protuberance may support large loads,

said connector element further comprising a tab extending vertically from said protuberance and adapted to bear against a horizontal edge of said slot at the inner face thereof.

4,181,280

BELL ASSEMBLY FOR A CHAIR SUPPORT

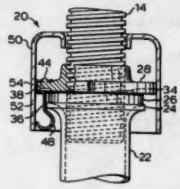
Vincent G. Bowman, Baden, Canada, assignor to Faultless-Doerner Manufacturing Inc., Canada

Filed Mar. 8, 1978, Ser. No. 884,526

Claims priority, application Canada, May 18, 1977, 278736

Int. Cl.² F16M *11/00*

U.S. Cl. 248—405 **9 Claims**



1. A bell assembly for adjusting the height of an upright chair support post slidably located in a concentric hub mounted in a chair base, the bell assembly comprising:

a bell nut threadably mounted on said support post and adapted to prevent longitudinal downward movement of said support post relative to said hub;

a spring retaining clip removably mounted on a peripheral edge portion of the bell nut, the retaining clip having a base portion which is generally C-shaped and which engages said bell nut peripheral edge portion, and a distal portion spaced below the bell nut and extending radially inwardly for engagement with said hub upon longitudinal movement between the bell nut and hub for preventing separation of the support post and hub; and,

a bell housing mounted on the bell nut, said housing having a wall portion located adjacent to said spring retaining clip for preventing rotational movement of the clip base portion relative to the bell nut.

4,181,281

ARTICULATED MULTI-SWIVEL CHAIR

Kerry D. Kosak, P.O. Box 905, Malibu, Calif. 90265

Filed Dec. 4, 1978, Ser. No. 965,999

Int. Cl.² A47C *3/18*

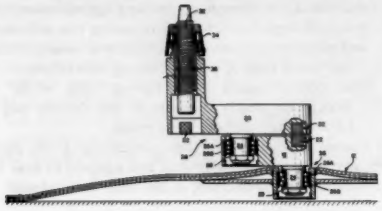
U.S. Cl. 248—416 **9 Claims**

1. In an articulated multi-swivel chair of the type having a base, an articulated support mechanism, and a chair body, the improvement comprising:

said articulated support mechanism including at least two links and two pivots,

each of said pivots having a friction loadable bearing and means for adjusting the load on said bearing to provide a predetermined magnitude of frictional force within each pivot, and

an anti-alignment device associated with said links and generating repulsive forces between adjacent of said links



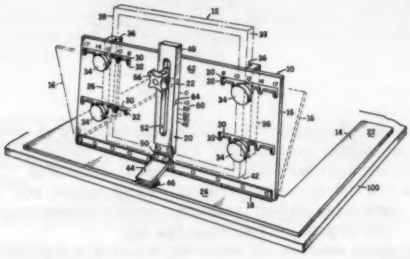
when said links are aligned, to bias said links out of alignment.

4,181,282

CASSETTE HOLDER

George D. Oliver, 29 Overlook Cir., Elizabethtown, Pa. 17022; Joseph T. Eisenhoffer, 5418 Devonshire, St. Louis, Mo. 63109, and Joseph H. Eisenhoffer, 5320 Daggett, St. Louis, Mo. 63110

Filed Jun. 22, 1977, Ser. No. 809,024
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—448 6 Claims



1. A holder for an x-ray cassette, comprising:

(a) base means,

(b) holder means for the cassette,

(c) hinge means connecting the holder means to the base means for swinging movement of said holder means relative to said base means,

(d) support means between the base means and the holder means supporting the holder means relative to the base means at a selected angle of inclination, said support means including:

(1) a first link means hingedly attached to one of said base means and holder means,

(2) a second relatively elongate link means hingedly attached to the first link means and slidingly related to said one of said base means and holder means in a direction lengthwise of said second link means, and

(3) clamping means selectively clamping the sliding second link means to the other of said base means and holder means in adjustable relation, and

(e) said holder means including a plate,

(f) the second link means extending generally perpendicularly of the axis of swinging movement in substantially parallel sliding relation with said plate, and

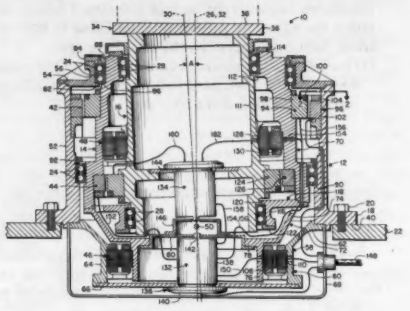
(g) said holder means including a pair of spaced guide arm substantially parallel to said second link means and attached to said plate on either side of said support means and adapted to engage said cassette in overlapping retaining relation.

4,181,283

ROTARY MOUNT CHARACTERIZED BY VARIABLE CONING MOTION

Anthony A. Rizzo, Torrance, Calif., assignor to TRW Inc. Systems & Energy, Redondo Beach, Calif.

Filed Feb. 21, 1978, Ser. No. 879,170
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—550 16 Claims



1. A rotary mount having a variable coning motion, comprising:

a relatively stationary base for attachment to a support,

a rotor mounted on said base for rotation on a fixed axis relative to said base,

a rotary platform mounted on said rotor for rotation on an axis relative to said rotor,

said axes being disposed at an acute angle relative to one another, and said platform having a reference axis disposed at an angle to said platform rotation axis, whereby said rotor and platform are selectively rotatable individually and in unison relative to one another and to said base to angularly displace said reference axis relative to said fixed axis through a range of skew angles and directions, and

said platform including mounting surface means inclined at an oblique angle relative to said platform rotation axis for mounting an object on said platform in predetermined relationship to said reference axis, and

drive means for selectively driving said rotor in rotation on said fixed axis relative to said base and said platform in rotation on said platform rotation axis relative to said rotor.

4,181,284

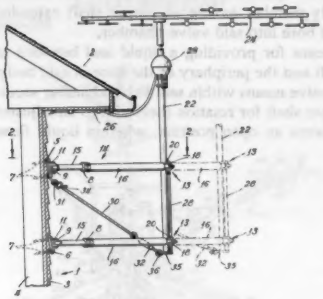
ANTENNA BRACKET FOR EXTERIOR WALLS

Merle N. Seppelfrick, R.R. 1, Harter Rd., Elburn, Ill. 60119

Filed Jun. 9, 1978, Ser. No. 914,672
Int. Cl.[2] A01K *97/10;* A45B *25/28*
U.S. Cl. 248—514 7 Claims

1. An antenna supporting bracket adapted for attachment to an exterior wall of a building, the bracket comprising a vertical post, four adjustable length arms, two of the adjustable length arms being rotatably connected to the upper portion of the post and two of the adjustable length arms being rotatably connected to the lower portion of the post, means to lock the adjustable length arms to a fixed length, two substantially flat upper fastening plates having a plurality of apertures spaced longitudinally and transversely thereof rotatably supporting two of the adjustable length arms, two substantially flat lower fastening plates having a plurality of apertures spaced longitudinally and transversely thereof rotatably supporting two of the adjustable length arms, screw means received by the apertures in the upper and the lower fastening plates to secure the antenna supporting bracket to the exterior wall, a flange portion an integral part of the upper fastening plate, a cable fas-

tened at both ends to each of the flanges on the upper plate, means for fastening the cable to the flanges, a turnbuckle by which the center portion of the cable is gripped, means to



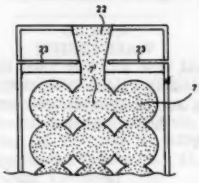
fasten one end of the turnbuckle to the lower portion of the post, and two clamping plates, one an integral part of the upper portion of the post and the other an integral part of the lower portion of the post for mounting a mast.

4,181,285

FREEZING MOULD BAG

Erling Vangedal-Nielsen, Kirke Vaerløsevej 67, DK-3500 Vaerlose, Denmark

Filed Jan. 24, 1978, Ser. No. 872,023
Claims priority, application Denmark, Jan. 25, 1977, 309/77
Int. Cl.[2] B28B *7/34, 7/06*
U.S. Cl. 249—61 **15 Claims**



1. A disposable freezing mould bag for receiving and retaining therein liquid to be frozen into a plurality of objects suitable for human consumption, and for being destroyed to gain access to the frozen objects, the mould bag comprising: first and second generally rectangular opposed sheets of thin and flexible plastics material defining the walls of the mould bag, said opposed sheets having top edges, bottom edges and side edges, and being flat and lying in contact with one another prior to the bag being filled with liquid; said first and second opposed sheets being heat sealed at a plurality of positions spaced over selected portions of the sheets, with the exception of defined unsealed portions for receiving the liquid to be frozen;

the unsealed portions in a lower generally rectangular portion of the bag defining a plurality of interconnected compartments of substantially the same configuration, the compartments being interconnected by channels of reduced cross-sectional area, the walls of the compartments being defined by said opposed sheets, and being in substantial contact with each other prior to filling of the bag and each being distended away from the other by the liquid to be frozen after filling of the bag, said first and second opposed sheets being of a thickness so as to be rupturable at said unsealed compartments to facilitate removal of the frozen objects from the bag; and

the unsealed portions in an upper generally rectangular portion of the bag defining a filling channel extending from the top edge of the bag to at least one of said compartments so that liquid entering the opening of said filling channel flows into, distends, and fills all of the compartments;

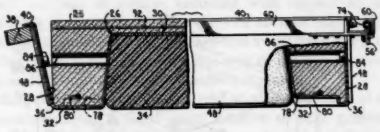
said bag being flat when unfilled, adapted to receive liquid through said filling channel to all of said compartments to bulge the walls of the compartments due to the presence of the liquid, and to form a frozen mass defined by all of said compartments and unsealed channel areas therebetween, said frozen mass in the channels between compartments being readily breakable when the compartments are ruptured to gain access to the frozen objects in the compartments.

4,181,286

REINFORCED PLASTIC MOLD FOR CONCRETE PANELS

David A. Van Doren, P.O. Box 1008, Hays, Kans. 67601

Continuation-in-part of Ser. No. 782,175, Mar. 28, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,174
Int. Cl.[2] B28B *7/06*
U.S. Cl. 249—82 **21 Claims**



1. A mold for forming precast panels, said mold comprising:

a one-piece mold body of flexible material configured to impart a desired shape to a molded product formed therein, said body having a panel-forming component provided with a plurality of integral sides presenting the periphery of the body,

said sides having free end edges to present pliable flaps swingable on said component outwardly from normal, molding positions and away from a molded product within the mold body to permit said product to be withdrawn therefrom,

the free end edges of adjacent sides defining closed corners of the body when said sides are in their normal positions and, upon said outward swinging movement of the sides, said edges separating to cause said corners to open;

a plurality of elongated reinforcing members on corresponding sides extending therealong on the outside of said body,

each of said members being secured to the corresponding side for movement therewith as said corners are opened and closed, and said members being constructed and arranged to prevent outward bowing of said sides when the mold body is filled with a material to be cast; and

releasable means associated with said edges for holding the corners closed to maintain said sides in their normal positions during the molding process.

4,181,287

MOLDING APPARATUS FOR RIGID FOAM PIPE INSULATION

C. Stephen Richter, Merrimack, N.H., and Russell L. Ault, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 26, 1978, Ser. No. 918,997
Int. Cl.[2] B41D *3/08*
U.S. Cl. 249—154 **15 Claims**

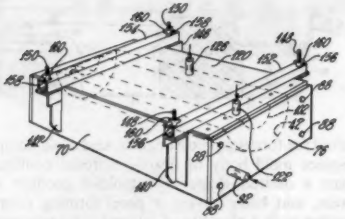
1. Molding apparatus for forming rigid foam components suited for insulatively covering pipes and the like, comprising:

a female mold component including a concavely oriented female mold surface formed of metal sheet material, having a length defined by first and second spaced endwise edges, and shaped to define a substantially semicircular

cross section extending between oppositely disposed elongate edges, a plurality of rigid crossmembers spaced in predetermined alignment along the lengthwise extent of the convex side of said mold surface, each having a concavity shaped in correspondence with said mold surface for providing spaced supportive contact with the underside thereof extending from the vicinity of one said elongate edge to the other and each having a base edge spaced from the lowermost level of said concavity and a pair of oppositely disposed uppermost edges extending outwardly respectively from the juncture thereof with said metal sheet material in the vicinity of said elongate edges, and connecting means attaching said metal sheet material in mutually supporting relationship with said crossmembers along the said concavities thereof;

a top member removably positionable over said female mold component, supportable from said crossmembers, and having a lower disposed flat surface substantially continuously engageable with each said metal sheet material elongate edge when positioned over said female mold component to effect the closure of the upwardly facing portions thereof;

a male mold component including a convexly oriented male



mold surface formed of metal sheet material, having a length defined by first and second endwise edges and corresponding with the length of said female mold component, and having a substantially semicircular cross section extending between oppositely disposed elongate edges, a plurality of rigid support members each having a semicircularly shaped periphery, the support members being positioned transversely to and spaced along the lengthwise extent of the concave side of said male mold surface, each having a base portion connected with the lower flat surface of said top member in a manner wherein said elongate edges are in substantially continuous adjacency therewith, and connecting means attaching said metal sheet material in mutually supporting relationship with said crossmembers along the circular peripheral portions thereof;

first and second end panels each having a flat inwardly disposed surface mountable against respective said first and second spaced endwise edges of said female and male mold components when said top member is positioned over said female mold component, thereby defining a mold cavity; and

an access opening for charging said mold cavity with an expansible material.

4,181,288

FLUID PRESSURE REGULATOR VALVE UNIT FOR A FLUID DELIVERY SYSTEM

Simon Bylsma, P.O. Box 3704, Temple, Tex. 76501

Filed Apr. 5, 1978, Ser. No. 893,759
Int. Cl.[2] F16K *31/04, 5/00*
U.S. Cl. 251—133 **2 Claims**

1. A liquid pressure regulator valve unit for controlling the pressure of a spray solution in a delivery line of a liquid system for supplying liquid to at least one outlet at a desired pressure, said valve unit comprising:

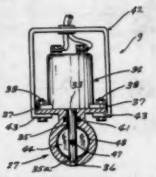
(a) a body member having a valve chamber with open ends,

(b) said body member having a side wall with a bore therethrough open to said valve chamber,

(c) a low speed reversible electric motor mounted on said body member having an output shaft extended through said bore into said valve chamber,

(d) means for providing a liquid seal between said motor shaft and the periphery of the bore in said body member,

(e) a valve means within said valve chamber secured to said motor shaft for rotation therewith to an adjusted position between an open position, wherein liquid flow through



said valve chamber is substantially unobstructed, and a closed position, said valve means having a diameter less than the internal diameter of said chamber so that there is formed a minimum flow passage through said valve chamber when said valve is in the closed position therefor to prevent hammering in the system as said valve is moved to the closed position; and

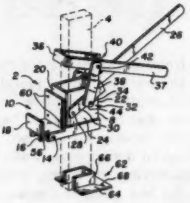
(f) an electric circuit for said motor including a switch means for reversely operating said motor to rotate said valve means to an adjusted position to precisely control the pressure of the spray solution in the delivery line.

4,181,289

WALL LIFTER

Leonard E. Koffski, R.R. #4, 7534 Trans Canada Hwy., Duncan, British Columbia, Canada (V9L 3W8)

Filed Jul. 10, 1978, Ser. No. 923,361
Int. Cl.[2] B66F *1/00*
U.S. Cl. 254—107 **12 Claims**



1. A wall lifter able to be made to climb a column to lift a prefabricated wall into a predetermined position, the lifter comprising:

a first sleeve to surround the column;

a saddle to engage the wall, the saddle extending forwardly of the first sleeve and being pivotably mounted;

a first lever pivotably mounted on the first sleeve at a first position adjacent the saddle and able to raise and tilt said first sleeve;

a fulcrum point for the first lever;

a second sleeve to surround the column disposed above the first sleeve when the lifter is in its useful position;

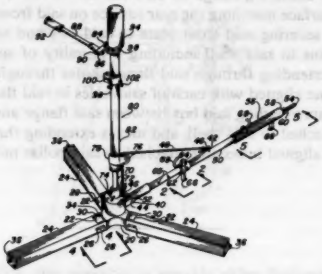
a second lever extending from the second sleeve to permit tilting of the second sleeve on the column, and

a link between the first and second sleeves, pivotably connected to each sleeve.

4,181,290
MANHOLE COVER LIFTING DEVICE

Bill G. Affolter, 279 Albert Pl., Costa Mesa, Calif. 92726

Filed Dec. 15, 1978, Ser. No. 969,833
Int. Cl.[2] B66F *17/00*
U.S. Cl. 254—124 14 Claims

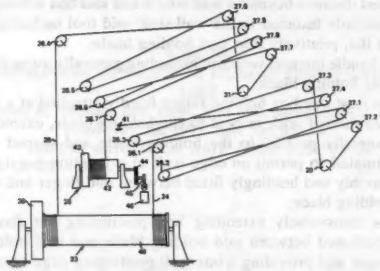


1. A manhole cover lifting device comprising:
(a) a base structure suitable to be positioned on the ground;
(b) a plurality of legs attached to said base structure extending radially being parallel to the ground upon which they are sitting;
(c) a vertical upright column structure rotatably attached to said base structure;
(d) a lifting arm pivotally attached to said upright column structure capable of vertical movement with means for attaching a manhole cover; and
(e) linear actuating means to raise and lower said lifting arm and rotating means to rotate it about the axis of the base.

4,181,291
APPARATUS FOR SUPPORTING AND CONTROLLING THE GRABBING DEVICE OF HOISTING GEAR

Sture G. Gulliksson, Ornskoldsvik, Sweden, assignor to Aktiebolaget Hagglund & Soner, Ornskoldsvik, Sweden

Filed Sep. 20, 1977, Ser. No. 835,027
Claims priority, application Sweden, Oct. 13, 1976, 76113307
Int. Cl.[2] B66D *1/26*
U.S. Cl. 254—184 10 Claims

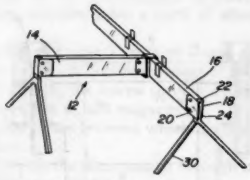


1. Apparatus for supporting and controlling an openable-closable grabbing device of hoisting gear which includes a load winch drum, said apparatus comprising:
an extensible, retractible load rope anchoring device;
first and second supports for the openable-closable grabbing device;
a first load rope wrapped at one end around the load winch drum, and being rigged, then around said first support for the openable-closable grabbing device, and at the opposite end thereof to said extensible-retractible anchoring device;
a second load rope wrapped at one end around the load winch drum, and being rigged, then around said second support for the openable-closable grabbing device, and to a fixable anchoring device;
means for extending and retracting the extensible-retractible anchoring device by a selected amount for opening and closing the grabbing device,
whereby the grabbing device is supported by both the first and second load ropes, and both load ropes are taken up and paid out in a synchronized manner as the load winch drum is operated, and the grabbing device is opened and closed by effectively lengthening and shortening the amount of the first load rope in use relative to the amount of the second load rope in use by operating said means for extending and retracting said extensible-retractible anchoring device;
the first support for the openable-closable grabbing device comprising:
a pulley block having said first load rope entrained thereabout;
a yoke suspended from said pulley block;
at least one pair of pulleys mounted with respect to said grabbing device where one pulley of each of said at least one pair of pulleys moves toward and away from the other pulley of each of said at least one pair of pulleys for opening and closing said grabbing device; and
a hauling rope connected at one end to said yoke, and at the opposite end to a fixed point relative to said grabbing device, and being entrained about each of the pulleys of said at least one pair of the pulleys, whereby:
shortening and lengthening of the relative amount of said first load rope in use by operating said means for extending and retracting said extensible-retractible anchoring device, withdraws and advances said yoke relative to said fixed point and moves said one pulley of each of said at least one pair of pulleys toward and away from the other pulley of each of said at least one pair of pulleys, thus opening and closing the grabbing device.

4,181,292
BARRICADE BRACKET

Clayton F. Hubel, 5409 Glenn Ave., Flint, Mich. 48505

Filed Feb. 28, 1978, Ser. No. 882,237
Int. Cl.[2] A01G *17/06*; E04H *17/00*
U.S. Cl. 256—23 9 Claims

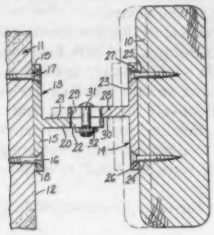


1. In a barricading system of the type wherein barricading boards emplaced about hazards are provided with end caps on at least one end thereof said end caps comprising parallel legs and an interconnecting bight, a space being defined between the end cap and the end of the barricading board, a bracket for interconnecting at least two barricade boards in an angular relationship, comprising:
(a) a first element associated with and adapted to be slid over a first barricade board, and
(b) a second element laterally removed from said first element, adapted to be slidingly inserted into the space defined between the end cap and the end of the second board.

4,181,293
HANDRAIL SUPPORT HARDWARE

Ralph S. Laribee, Plantsville, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Sep. 22, 1977, Ser. No. 835,485
Int. Cl.[2] E04F 11/18
U.S. Cl. 256—67 2 Claims



1. In combination with a handrail and a vertical support therefor, a handrail support assembly comprising,

a pair of essentially identical bracket members, one of said members adapted to be mounted to said support and the other to said handrail,

each of said bracket members having a mounting plate and an arm extending outwardly from said mounting plate intermediate the ends thereof,

said arms having mating serrations defined thereon in the direction of the handrails,

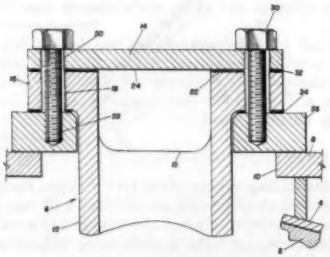
elongated slots in said arms perpendicular to said serrations adapted to receive a clamping means therethrough whereby the arms are positioned to uniformly predetermine the distance of the handrail from the support and the arms are held in compressive engagement with said mating serrations intermeshed,

and means in each mounting plate on either side of the arm for securing each plate to one of the handrail and the support whereby the mounting plate is secured on either side of the arm, said means including slots elongated in the direction of the handrail in at least one of said members.

4,181,294
COOLING PLATES FOR A FURNACE

Herbert A. White, Jr., 2516 Collins Rd., Pittsburgh, Pa. 15235

Filed Feb. 22, 1979, Ser. No. 14,051
Int. Cl.[2] C21B 7/10
U.S. Cl. 266—194 7 Claims

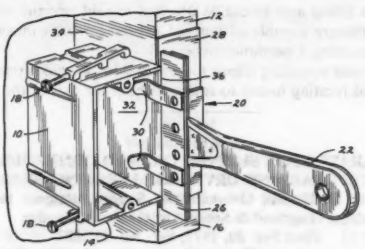


1. In a furnace wall including a refractory lining, an outer steel shell having an opening therethrough, cooling apparatus extending through said opening and means securing said cooling apparatus to said steel shell, said cooling apparatus including a front plate, a water tight box having an opening in its front end, means detachably securing said box to said front plate with the front plate closing the front opening in said box, said front end opening extending over the majority of the area of the front end so as to permit visual inspection of the inside of said box when said front plate is removed, means for supplying coolant through said front plate into said box, and means for removing coolant from said box through said front plate; the improvement in said cooling apparatus including an outwardly extending flange on the front end of said box having a front surface matching the rear surface on said front plate, said means securing said front plate to said box and said cooling apparatus to said shell including a plurality of spaced apart holes extending through said flange, holes through said front plate one aligned with each of said holes in said flange, collar means surrounding said box between said flange and said shell and attached to said shell, and means extending through each of said aligned holes and attached to said collar means.

4,181,295
BOX SETTING TOOL

Eugene P. Duffy, 1025 Lowry Ave. N.E., Minneapolis, Minn. 55418

Filed Jul. 31, 1978, Ser. No. 929,334
Int. Cl.[2] B25B 21/20
U.S. Cl. 269—3 4 Claims



1. A box setting tool for temporarily positioning and holding a junction box having at least one edge wall provided with a leading edge portion lying in a plane surface to extend a predetermined distance beyond a wall stud while said box is being at least partially fastened to the wall stud, said tool including:

A. a flat, relatively thin, box holding blade;

B. a handle integral with and extending generally away from said holding blade;

C. at least one box holding finger fixedly attached at a first end thereof with respect to the holding blade, extending generally parallel to the holding blade and shaped and situtated to permit an edge wall of a junction box to be forcibly and holdingly fitted between said finger and said holding blade;

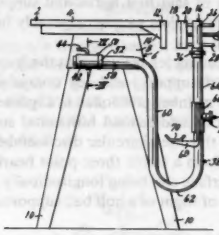
D. a transversely extending box positioning bar fixedly positioned between said holding blade and said holding finger and providing a box wall positioning edge situated to limit the inward movement of said leading edge portion of said box edge wall between said finger and said box holding blade;

E. a stud contact blade fixedly mounted with respect to said holding blade and said box positioning bar to provide a stud contacting face extending outwardly from the holding blade at a side opposite said positioning bar and at right angles to the plane of said box holding blade and parallel to said box positioning edge of said box positioning bar.

4,181,296
BENCH VISE

Alvin L. Bassett, 2148 S.E. 135th St., Portland, Oreg. 97233

Filed Jun. 19, 1978, Ser. No. 916,741
Int. Cl.[2] B25B *1/22*
U.S. Cl. 269—88 9 Claims



1. A bench vise operable to provide either horizontal jaw action or vertical jaw action alternatively, said bench vise comprising:

a. A floor-supported table having a horizontal planar table top and a vertical planar apron depending from the forward edge of said table top, both said table top and said apron each being capable of serving as the fixed jaw of a vise jaw combination,

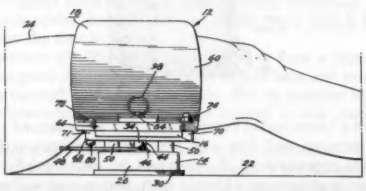
b. a movable jaw fixture including mounting portions, a planar movable jaw carried by said mounting portions, said movable jaw being generally rectangular and horizontally elongated, said mounting portions including a pair of short pipes extending parallel to the plane of said movable jaw and to the minor dimension of said jaw, respectively adjacent the opposite narrower ends thereof, and manually operable screw means for moving said jaw laterally of said short pipes, and

c. a pair of alternatively usable sets of brackets each adapted to support the mounting portions of said movable jaw fixture with the plane of said movable jaw disposed parallel to and outwardly from said apron, and the second of said sets of brackets supporting said fixture with the plane of said movable jaw disposed parallel to and upwardly from said table top, each of said bracket sets comprising a pair of longer pipes, means detachably affixing one end of each of said longer pipes to said table beneath the level of said table top, and a pipe coupling detachably connecting the opposite end of each of said longer pipes to one of the short pipes of said movable jaw fixture.

4,181,297
POSITIONING DEVICE FOR HUMAN LIMBS AND THE LIKE

Thomas K. Nichols, Box 760A, R.D. #2, Andover, N.J. 07821

Filed Nov. 16, 1977, Ser. No. 851,867
Int. Cl.[2] A61G *13/00*; A61F *13/00*; F16C *11/00*
U.S. Cl. 269—328 13 Claims

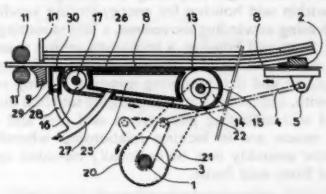


1. A positioning device for holding a human limb or the like in a fixed position above a table surface, comprising a rectangular elongated limb support plate, a single suction cup assembly attached to said support plate, said suction cup assembly providing means for selective attachment to a table surface to support said plate in parallel spaced relation to said table surface, a pair of opposed upstanding clamp assemblies disposed on said support plate, each of said clamp assemblies comprising a clamp member having a concave limb-engaging surface thereon, at least one of said clamp assemblies being slidably mounted on said support plate to permit selective movement thereof relative to the other said clamp assembly, means for adjusting the relative angular orientation of at least said slidable clamp assembly to accommodate the taper of a limb clamped therebetween, means for releasably locking said slidable clamp assembly in the desired position on said support plate, one end of said support plate extending substantially further beyond the suction cup assembly than the other end thereof, said slidable clamp assembly being adapted to slide along said extending end of said plate, said suction cup assembly comprising a rigid downwardly opening cup secured to said support plate, a resilient diaphragm extending beneath said cup, means for withdrawing said diaphragm partially into said cup to create a partial vacuum therebeneath and to secure said assembly to a table surface, said latter means comprising actuating means including an actuating lever disposed beneath said extending end of said support plate, and locking means for preventing rotation of said support plate and cup with respect to said diaphragm.

4,181,298
DEVICE FOR SYNCHRONIZED INTRODUCTION OF SHEETS INTO A TREATMENT MACHINE

Bernard Capdeboscq, St. Just Chaleyssin, France, assignor to S.A. Martin, Villeurbanne, France

Filed May 31, 1978, Ser. No. 911,145
Claims priority, application France, Jun. 2, 1977, 77 16831; Feb. 27, 1978, 78 05494
Int. Cl.[2] B65H *3/64*
U.S. Cl. 271—5 5 Claims



1. In a device for the synchronised introduction of sheets into a treatment machine from a stack of sheets, the device comprising:

a magazine for receiving a stack of sheets and including a feed table on which the lowest sheet of the stack rests;

a pusher for pushing the lowest sheet in a stack in the magazine forward out of said magazine;

adjustable stop means between which the sheet is pushed by said pusher;

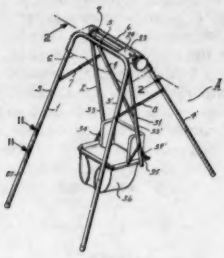
rollers for driving the sheet passing through said stop means forward into the machine;

means for causing rectilinear reciprocating movement of said pusher comprising a drive shaft and means for driving said shaft with an alternating rotational movement, in phase with the general drive of the treatment machine, so as, in each cycle, successively to cause said pusher to push the lowest sheet of a stack forward between said adjustable stop means and towards said rollers for driving the sheet into the machine;

the improvement comprising, at the front part of the feed table, a suction box, means for continuously maintaining said suction box under suction, endless belt means of which the upper run extends above said suction box, and means for driving said belt means from said drive shaft

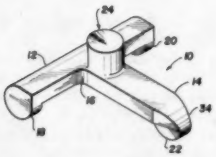
including freewheel transmission means arranged such that, during the forward movement of said pusher, said belt means are driven forward by the same distance and in the same direction as said pusher, and during said return movement of said pusher, said belt means remain immobile.

4,181,299
SPRING POWERED SWING
Edwin E. Foster, 1801 Camp Craft Rd., Austin, Tex. 78746
Filed Jan. 9, 1978, Ser. No. 867,674
Int. Cl.[2] A63G *9/16*
U.S. Cl. 272—86 **21 Claims**



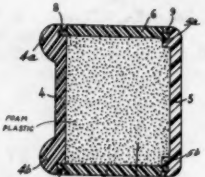
1. A swing comprising a frame, said frame having components spaced apart in the upper portion thereof, a rock shaft presented in the spacing between said frame components and engaged to said frame for axial rockable movement, a body-support structure secured to said rock shaft and depending therefrom for to and fro swinging movement, a mounting plate secured on said frame and having an extended portion presented spacedly from, beyond, one end of said rock shaft, a spring motor assembly comprising a housing and a spring disposed within said housing for energy-storing winding and energy-releasing unwinding movement, a first mounting means projecting from said housing, a second mounting means provided on said mounting plate extended portion for cooperatively engaging said first mounting means in locking relationship therewith, and means for interengaging said first mounting means and said mounting plate when said first and second mounting means are in locking relationship whereby said spring motor assembly may be optionally mounted upon, or demounted from, said frame.

4,181,300
GOLF TEE
Arthur S. Bradley, 342 N. 116th St., Wauwatosa, Wis. 53110
Filed Oct. 19, 1977, Ser. No. 843,503
Int. Cl.[2] A63B *57/00*
U.S. Cl. 273—33 **1 Claim**



1. A golf ball tee comprising:
a first horizontal support;
a second horizontal support normally connected to said first horizontal support to form a generally "T" shaped structure;
a downwardly extending leg fashioned at one end of said first horizontal support; said leg comprising a first semicircular disc member positioned transverse to a longitudinal axis of said first horizontal support wherein the periphery of said disc member operably bears upon a ground surface;
a downwardly extending leg fashioned at the other end of said first horizontal support; said leg comprising a second semicircular disc member positioned transverse to the longitudinal axis of said first horizontal support wherein the periphery of said disc member operably bears upon a ground surface;
a downwardly extending leg fashioned at the free end of said second horizontal support; said leg comprising a third semicircular disc member positioned in alignment with the longitudinal axis of said second horizontal support, said first, second and third semicircular disc members combining to operably form a stable three point bearing contact with a ground surface and being longitudinally directed in the intended line of flight of a golf ball supported upon the golf tee;
a solid right cylindrical golf ball supporting stanchion integrally fashioned with said first and second horizontal support members and projecting above a surface plane of said first and second horizontal support members, said solid right cylinder termining in an inwardly directed cone whereby a golf ball may be operably supported upon a peripheral base portion of the inwardly directed cone;
said solid right cylindrical golf ball supporting stanchion having a longitudinal axis and said stanchion being positioned upon said second horizontal support member wherein said axis is equidistantly spaced from mutually parallel axes extending through the bearing point of each of said semicircular disc members; and
the end most portions of said first horizontal support being terminated with a substantially planar surface transverse to a longitudinal axis of the support and mutually parallel with an intended line of flight of a golf ball and the end most portion of said second horizontal support being tapered toward the end thereof in the direction of the intended line of flight of a golf ball struck from said golf ball tee.

4,181,301
TENNIS RACKET
Gerard Cholat-Serpoud, Sillans, and Maurice Legrand, Voiron, both of France, assignors to Skis Rossignol S.A. Club Rossignol S.A. Societe Anonyme, Voiron, France
Filed Jul. 25, 1977, Ser. No. 818,734
Claims priority, application France, Jul. 28, 1976, 76 23758; Jul. 29, 1976, 76 24226
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 C **11 Claims**



1. In a tennis racket comprising a first and a second profiled wall member, said first wall member being open-ended and defining opposite sides of a shaft and the outer periphery of an annular head integral with said shaft, said second wall member forming a closed loop which defines the inner periphery of said head, and further comprising a pair of substantially flat parallel wall elements defining opposite planar faces of said shaft and said head, said wall members and said wall elements adjoining

one another generally orthogonally and forming between them a closed space filled with a synthetic mass,

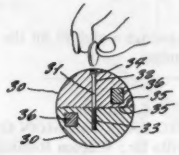
the improvement wherein said wall members have reinforced edges provided with confronting grooves, said wall elements having peripheral ribs set back from said planar faces and received in said grooves.

4,181,302

HALF BALL GAME

Carl E. Sexton, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Feb. 17, 1977, Ser. No. 769,320
Int. Cl.[2] A63B *67/00, 37/10*
U.S. Cl. 273—95 R **1 Claim**



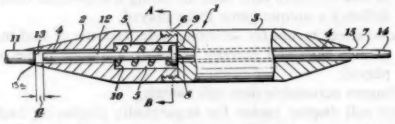
1. A game comprising a pair of hemispheric batting projectiles having matching flat surfaces including means for securing said members together to form a ball, in combination with a batting stick and markers to indicate varying distances from a batting position, whereby said projectiles can be used individually and also secured together as a batting projectile, wherein each said projectile includes a weight adjustably positioned relative to each other when secured together to provide a ball of variable weight distribution, wherein said projectiles are secured together by an axial member rotatably extending through one of said projectiles and threadedly engaging the other of said projectiles whereby said projectiles are relatively rotatable for varying the weight distribution of the assembled ball.

4,181,303

DARTS HAVING LOW REBOUND FREQUENCY

Kent Sjögren, Ortdrivarevägen 8, Grängesberg, Sweden

Filed Sep. 15, 1976, Ser. No. 723,616
Int. Cl.[2] A63B *65/02*
U.S. Cl. 273—106.5 B **7 Claims**



2. A dart comprising in combination

an elongated body having a longitudinally extending bore which opens through that end of the body which leads when the dart is thrown,

a portion of said bore being widened to form a chamber;

an elongated tip member disposed in said bore and projecting through said end of the body, said tip member having a transversely enlarged portion located in said chamber; and

a spring in said chamber between an end of the chamber and a spring in said chamber between an end of the chamber and said transversely enlarged portion of said tip member,

said spring urging said tip member forwardly relative to said body towards the forward end of said chamber;

the combination of said forward end of said chamber, said transversely enlarged portion of said tip member and said spring constituting limiting means for limiting relative axial movement between said body and said tip member;

the transverse cross-sectional dimensions of said bore are greater than the transverse cross-sectional dimensions of said tip member to permit limited movement of said tip member generally radially relative to said bore,

said spring, enlarged portion and chamber being such that the tip may penetrate a dart board even when the tip encounters an obstruction having the characteristics of a target-defining wire on the surface of a dart board.

5. A dart having flights that break away upon impact of the dart with a target, comprising:

(a) an elongated dart body having an axial bore;

(b) flights yieldingly held to one end of the body and having a part projecting into the bore;

(c) a point yieldingly held to the other end of the body in said axial bore and having a part projecting therefrom;

(d) and a stem slidably disposed in the bore between the flight and point with one end engaged by the point and the other end adjacent the flight part projecting into the bore;

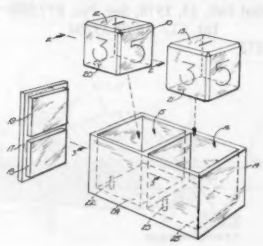
whereby impact of the dart on a target causes the body to override the point, sliding the stem rearwardly in the body to eject the flights from the body.

4,181,304

ILLUMINATED DICE AND STORAGE HOUSING

Terry M. Haber, 3029 S. Rosewood Ave., Santa Ana, Calif. 92707

Filed Jul. 21, 1978, Ser. No. 926,656
Int. Cl.[2] A63F *9/04;* **F21V** *33/00*
U.S. Cl. 273—146 **4 Claims**



1. An illuminated die and a storage housing therefor including, in combination:

(a) a die incorporating battery and light emitting means;

(b) a normally closed switch in said die for connecting said battery to said light emitting means;

(c) a storage housing defining a die receiving compartment for said die; and

(d) means in said compartment responsive to the placing of said die therein to open said normally closed switch.

4,181,305

APPARATUS FOR PLAYING A GAME

Michael Skidmore, 8, Carroways Pl., Margate, Kent, England

Filed Feb. 15, 1978, Ser. No. 877,943
Int. Cl.[2] A63F *9/08*
U.S. Cl. 273—153 S **7 Claims**

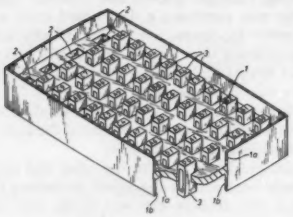
1. Apparatus for playing a game, said apparatus comprising:

a board having a plurality of substantially identical holes extending therethrough and arranged in two or more parallel columns of equal numbers of holes, and

a plurality of mutually distinguishable pegs each adapted to be removably received in any of said holes and each having at one end thereof a respective indicium of a first series of indicia and at the other end thereof a respective indicium of a second series of indicia, whereby the pegs can be

arranged in respective holes so that said first and second series of indicia can be viewed from respective sides of the board and wherein the number of pegs is less than the number of holes by at least the number of columns

and wherein at least some pegs have an indicium of the first



series which does not correspond in position in said series to the indicium of the second series on the same peg;

and wherein each of the first and second series of indicia are divided into respective mutually distinguishable subseries of equal numbers of pegs, the number of subseries being equal to the number of columns.

4,181,306

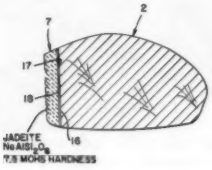
GOLF CLUB AND FACE PLATE THEREFOR

Harold C. Jepson, 2014 Ellen Ave., San Jose, Calif. 95125

Filed Feb. 13, 1978, Ser. No. 877,098

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—173 **3 Claims**



1. In combination, a golf club including a head having a golf ball striking face thereon, and a face plate inserted in said golf ball striking face, said face plate being wholly formed from a naturally occurring mineral material having a hardness factor of 7.5. mohs.

4,181,307

GOLF TRAINING DEVICE

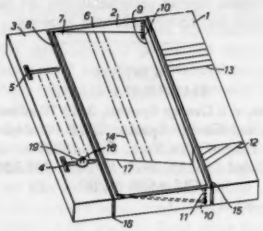
Joseph I. Krene, 6206 Roeding Rd., Hughson, Calif. 95326, and William T. Campbell, Simmonscourt Castle, Ballsbridge, Dublin 4, Ireland

Filed May 31, 1978, Ser. No. 911,109

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—183 A **7 Claims**

1. A golf training device comprising a foot support member presenting a platform to accommodate the feet of a golfer, a ball placement member having means to locate a golf ball in position to be hit by a golfer standing on the foot support member, a frame connecting the foot support member and the ball placement member so as to define a space therebetween, and a mirror mounted in the said space less distant from the foot support member than is the ball placement member, the mirror being arranged so that a golfer standing on the foot support member can directly observe his image between his



feet and the ball as he swings a club to hit the ball located on the ball placement member.

4,181,308

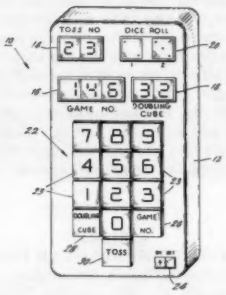
ELECTRONIC BACKGAMMON GAME

Elinor Fox, 534 Kickerillo Dr.; William Rubinstein, 546 Stoneleigh Dr., and William Hamilton, 435 Hickory Post, all of Houston, Tex. 77079

Filed Jul. 24, 1978, Ser. No. 927,457

Int. Cl.[2] A63F *3/02*

U.S. Cl. 273—237 **13 Claims**



1. An electronic backgammon game, comprising:

memory means for storing m unique sets of dice rolls, each of said m sets of dice rolls including n sequential rolls and defining a unique game to be played;

game select means for selecting a desired one of said m sets of dice rolls and thereby selecting a unique game to be played;

a human actuatable dice roll switch;

dice roll display means for sequentially displaying each of said n sequential rolls in said selected set of dice rolls, said control means to display the next sequential roll in said selected set of dice rolls each time said dice roll switch is reactived.

4,181,309

METHOD AND APPARATUS FOR GOLF PRACTICE AND INSTRUCTION

Kenneth W. Atkinson, 5 Breeze St., Gulf Breeze, Fla. 32561, and C. D. Lowell Longaker, Fort Walton Beach, Fla., assignors to Kenneth W. Atkinson, Gulf Breeze, Fla.

Filed Aug. 26, 1977, Ser. No. 827,874

Int. Cl.[2] A63B *69/36*

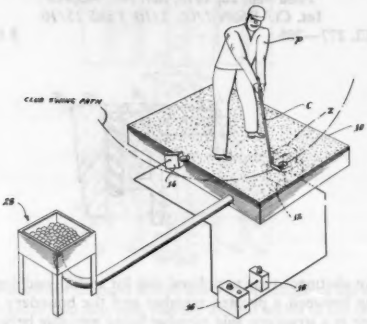
U.S. Cl. 273—186 R **20 Claims**

1. A method of practicing golf comprising in the course of a player's swing of a golf club, while the head of the club is

approaching a golf ball hitting zone, detecting the instant of movement of the club past a location in its swing path at a predetermined distance backward of the hitting zone, and striking a golf ball and thus projecting it by free flight into the hitting zone so that it enters into said zone into the path of the club head sweeping through said zone within a predetermined time after said instant.

6. An apparatus for practicing golf, comprising:

a station providing a golf ball hitting zone through which the head of a golf club is swept by a player performing golf swings, means operable in the course of a player's



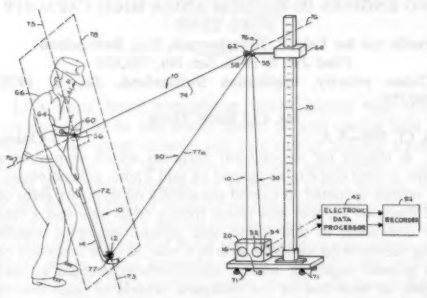
swing of a club for striking a golf ball and thus projecting it by free flight into said zone, and means actuated in response to the player's downswing of the club toward the hitting zone for activating said means for projecting the ball into said zone, said activating means including means for detecting the instant of movement of the club past a location in its swing path at a predetermined distance backward of the hitting zone, and means actuated by said detecting means for activating said projecting means so that a ball will enter into said zone within a preset time after said instant and will be in the path of the club head when the club head sweeps into said zone.

4,181,310

APPARATUS FOR ANALYZING THE MOVEMENT OF A DEVICE TO BE MANIPULATED

Noel A. Boehmer, 7760 Paseo Del Rey #101, Playa del Rey, Calif. 90291

Filed Dec. 27, 1977, Ser. No. 864,556
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A **20 Claims**



1. Apparatus for analyzing the movement of a device to be manipulated by a user thereof, comprising:

(a) a first flexible member attached at one end and at a first position to the device for extending and retracting in a taut manner with changes in distance, as measured along said member, between said first position and a second position through which said member passes;

(b) means for extending additional lengths of said first member corresponding to increases in said distance and retracting excess lengths of said member corresponding to decreases in said distance;

(c) a second flexible member attached at one end and at said first position to the device for extending and retracting in a taut manner with changes in distance, as measured along said member, between said first position and a third position through which said member passes;

(d) means for extending additional lengths of said second member corresponding to increases in said distance and retracting excess lengths of said member corresponding to decreases in said distance; and

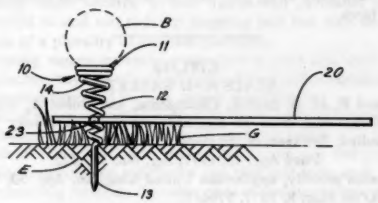
(e) means for slidably holding said first member to a fourth position intermediate, as measured along said member, said first and second positions.

4,181,311

GOLF TEE WITH LINE-OF-FLIGHT INDICATOR

Robert E. Lawlor, 17880 Los Alamos St., Fountain Valley, Calif. 92708

Filed Jun. 26, 1978, Ser. No. 918,796
Int. Cl.[2] A63B *57/00*
U.S. Cl. 273—206 **5 Claims**



1. A golf tee device comprising:

a. a body member describing a uniformly spaced spiral configuration concentrically surrounding the axis thereof;

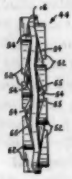
b. a golf ball retaining portion extending from one end of said body member;

c. an insertion portion extending from the other end of said body member and incorporating a point on the free end thereof for insertion into the ground, whereby such insertion of the tee into the ground shall be limited by said spiral body member;

d. a line-of-flight indicating member describing a generally triangular upper and lower planar surfaces and incorporating a bore therethrough, said spiral body member passing through said bore to the extent that said lower planar surface is positioned intermediate the ends of said spiral body portion and spaced from the juncture of said spiral body portion and said insertion portion to thereby provide a space between said lower planar surface and the ground into which said insertion portion is inserted and slidably engaging said indicating member such that the axis of said body member is perpendicular to the planar surface of said indicating member;

e. whereby axial rotation of said body member with respect to said indicating member results in translation of said indicating member along the axis of said body member.

4,181,312
SLINGER DEVICE
Fredrick Douglas, 10801 W. 54th St., Shawnee, Kans. 66203
Filed May 11, 1978, Ser. No. 904,864
Int. Cl.[2] F16J *15/54*
U.S. Cl. 277—133 **7 Claims**



1. A device for moving a liquid away from a bearing which supports a shaft, said device comprising:

a disc member presenting an opening therein adapted to receive the shaft in a manner to mount said disc member on the shaft for rotation therewith,

said disc member being characterized on at least one side by alternating inclined surfaces, two of said surfaces being disposed in back to back relationship to present a ridge,

a plurality of raised angular vane members disposed in spaced apart relationship between each pair of inclined surfaces,

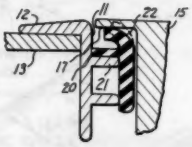
each of said vane members presenting opposed side surfaces which are contiguous with and project upwardly from an adjacent inclined surface, said side surfaces extending from said opening and merging toward each other as they approach the periphery of said disc member,

whereby liquid contacting said disc member is impelled outwardly along said side surfaces and said inclined surfaces.

4,181,313
SEALS AND GASKETS
Edward F. H. B. Hillier, Cheltenham, and Robin A. Walker, Winchcombe, both of England, assignors to Dowty Seals Limited, Tewkesbury, England
Filed Apr. 15, 1977, Ser. No. 787,922
Claims priority, application United Kingdom, Apr. 30, 1976, 17631/76; Mar. 8, 1977, 9796/77
Int. Cl.[2] F16J *15/10*
U.S. Cl. 277—166 **10 Claims**

1. A seal or gasket, which has at least one aperture providing a fluid passageway and which has at least one clamping location, disposed at a predetermined position thereon, at which said seal or gasket in use can be clamped, by clamping means, between surfaces of two parts to be sealed, said seal or gasket comprising conformable elastically-compressible non-metallic material and a plurality of discrete volumes of relatively-incompressible non-metallic material which are so disposed in and bonded to the elastically-compressible non-metallic material that they are closely-spaced one from another by portions of said elastically-compressible non-metallic material and together form an extrusion-limiting barrier, interrupted at intervals by said portions, which extends at least part-way around said aperture and which is spaced from said aperture by a border portion wholly of said elastically-compressible non-metallic material.

4,181,314
SELF DRAINING SEAL
Donald B. Cerf, and Perry J. Dreibus, both of 5435 Corning Ave., Los Angeles, Calif. 90056
Filed Sep. 26, 1978, Ser. No. 945,913
Int. Cl.[2] B60N *1/06, 1/10;* **F16J** *15/10*
U.S. Cl. 277—205 **8 Claims**

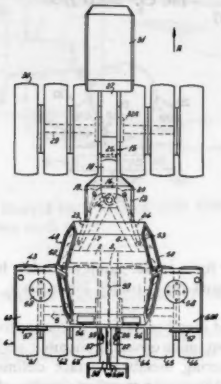


1. An abutment-type peripheral seal for sealing and draining the gap between a pivoted member and the boundary of an aperture in a structure, said member being movable between a tilted position wherein it passes through the aperture and projects beyond both sides of the structure, and a closed position where it lies in general alignment with the boundary and substantially closes the aperture, said member having an under face along a first part of its periphery, and an upper face along a second part of its periphery, said faces being directed in the direction of movement toward the boundary when the member moves from its tilted to its closed position, said seal being attached to said boundary, and having an upwardly-facing portion and a downwardly facing portion, each so disposed and arranged as respectively to make a fluid-sealing contact with the upper face and under face, respectively, of the member, the abutment of the downwardly facing portion and the under face and the abutment of the upwardly facing portion and the upper face serving to retain above said abutments water which enters said gap, said seal in its downwardly facing portion including channel means open to said gap, and an exit conduit connected to said channel means, both for the purpose of draining said channel means.

4,181,315
ARTICULATED AGRICULTURAL TRACTORS WITH TWO ENGINES IN TANDEM AND A HIGH CAPACITY FUEL TANK
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Jul. 8, 1976, Ser. No. 703,652
Claims priority, application Switzerland, Jul. 8, 1975, 08091/75
Int. Cl.[2] B60K *15/08*
U.S. Cl. 280—5 A **2 Claims**

1. A tractor for agricultural purposes which comprises a frame, at least one engine carried by said frame, ground engaging wheels mounted to extend outwardly on opposite sides of said frame to support said frame from a front axle and a rear axle connected to said frame, said ground engaging wheels being mounted on said rear axle in a row, at least a portion of said ground engaging wheels operatively connected to said engine, at least one of the outboard wheels of said row of wheels being removable, at least one wing-like fuel tank extending outwardly whereby each of its lateral sides extends beyond said frame and is disposed vertically over each wheel in said row of said ground engaging wheels including said outboard wheels and entirely above said rear axle, said fuel tank being disposed substantially perpendicular to the longitu-

dinal axis of said tractor and throughout substantially the entire width of the tractor, said fuel tank comprising at least one portion which is displaceable relative to a further portion thereon whereby on effecting such displacement and removing



said removable outboard wheel, the overall length of the major dimension of said fuel tank and the overall width of the tractor are correspondingly reduced, and a lifting device mounted on said frame to extend to the rear of the tractor from between said ground engaging wheels of said row.

4,181,316

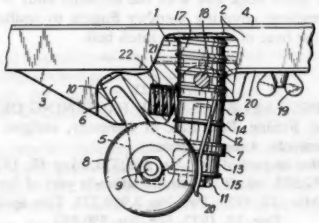
SKATE BOARD

Dieter Brand, Haar, and Fritz G. Pape, Eisbergen, both of Fed. Rep. of Germany, assignors to Stiebel Eltron GmbH & Co. KG, Holzminden, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,439

Int. Cl.[2] A63C *17/14*

U.S. Cl. 280—11.2 **7 Claims**



1. A skate board comprising: board means; two wheel mounts located on said board means; an axle carrier held by each of said wheel mounts; said axle carrier holding a roller axis elastically for two rollers; steering movements of said roller axes being produced by shifting a rider's weight; said board means having a longitudinal axis; transverse axle means located transverse to said longitudinal axis; at least one of said roller axes being pivotal about said transverse axle means; said board means being lowerable relative to said roller axis by applying the rider's weight; spring means; said board means being raisable relative to said roller axis by said spring means when the rider's weight is removed; said transverse axle being rigidly connected to said board means so that lowering and raising said board means do not produce steering movement of said roller axis; brake means on said board means and acting on said rollers when said board means is raised through absence of the rider's weight; said brake means being released when applying the rider's weight and lowering said board means.

4,181,317

BABY CARRIAGE

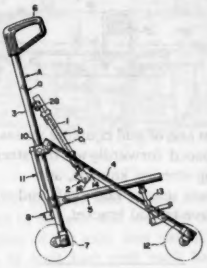
Tokuzo Toda, Shiroi, Japan, assignor to Kabushiki Kaisha Tokyo Bebi, Tokyo, Japan

Filed May 8, 1978, Ser. No. 904,033

Claims priority, application Japan, Oct. 25, 1977, 52/143848[U]; Oct. 25, 1977, 52/143849[U]

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—42 **4 Claims**



1. In a baby carriage having right and left frames and which is folded while drawing said frames towards each other, the improvement comprising:

rest rods pivotably connected to said frames and capable of being inclined in a stepped manner in a plurality of positions;

locking means secured to said frames and pivotably connected to said rest rods for stopping said rest rods in any one of a plurality of inclined positions;

operating means movably connected to said rest rods for selecting any one of said plurality of inclined positions and for engaging said locking means accordingly;

a pair of upper operation rods, each having one end pivotally connected to a different one of said rest rods;

a pair of lower operation rods, each having one end pivotally connected to a different one said rest rods; and

a connecting member, the other ends of said upper operation rods being pivotally connected to one end of said connecting member, the other end of said lower operation rods being pivotally connected to the other end of said connecting member;

said operation rods and connecting member forming a back support for said carriage.

4,181,318

VEHICLE WHEEL STEERING STABILIZER

Richard E. Applegate, 9521 Helena St., Montclair, Calif. 91763

Filed Jan. 3, 1978, Ser. No. 866,388

Int. Cl.[2] B62D *7/08*

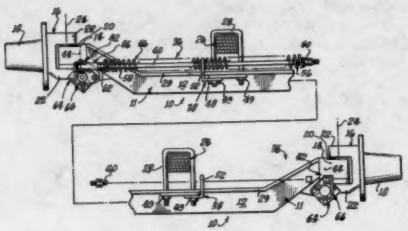
U.S. Cl. 280—94 **10 Claims**

1. In a vehicle having a rigid front axle, leaf spring assemblies attached to said axle for resilient supporting of the vehicle chassis on said axle, front steering wheel knuckles pivotally mounted on the ends of said axle for steering movement about steering axes, and steering linkage including king nuts secured to said steering knuckles for turning the latter in their steering movement about said steering axes, the improvements comprising:

a steering stabilizer pivotally connected between said axle and each king nut including spring means for yieldably biasing the corresponding front wheel steering knuckle to a neutral position about its steering axis,

each steering stabilizer comprising a bracket secured to said axle, a stabilizer shaft extending generally end-wise of said

axle and loosely through said bracket for end-wise movement relative to said bracket, said shaft having an outer end adjacent the king nut for the corresponding front wheel steering knuckle, and coupling means pivotally connecting said outer shaft end to the respective king nut



with the pivot axis of said coupling means generally parallel to and spaced forwardly of the steering axis of the corresponding steering knuckle, and

said spring means urging said shaft end-wise to a neutral position relative to said bracket.

4,181,319

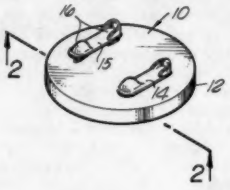
SKI SKATEBOARD

Farrokh Hirbod, 6424 Via Colinita, Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 900,360, Apr. 26, 1978, abandoned. This application Sep. 18, 1978, Ser. No. 943,039

Int. Cl.[2] B62M *1/04*

U.S. Cl. 280—221 **20 Claims**



1. A skateboard apparatus comprising:

a platform having at least one slot therethrough;

a suspension means interconnected to the platform, the suspension assembly comprising:

a first set of axles positioned on a first side of the platform and a second set of axles, positioned on a second side of the platform, each axle interconnected to the platform and rotatable about its longitudinal axis, at least one of the axles having an eccentric portion along its length, the first set of axles being independently moveable relative to the second set of axles in a vertical plane relative to the plane of the platform, a plurality of wheels, one attached to at least one end of each axle, each wheel attached to the end of an axle having an eccentric portion, being adapted for rotating freely in only one direction;

at least one drive means rotatably connected to the eccentric portion of one of the axles having an eccentric portion, the drive means extending through the slot in the platform for being reciprocated by an operator to impart rotation to the attached axle.

4,181,320

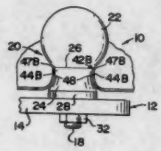
TRAILER HITCH PROTECTOR

Walter H. Wellborn, Jr., 150 Devon Dr., Clearwater Beach, Fla. 33515

Filed May 6, 1977, Ser. No. 794,536

Int. Cl.[2] B60D *1/06*

U.S. Cl. 280—507 **7 Claims**



1. A protector for a trailer hitch assembly having a trailer hitch ball supported on a trailer hitch neck, comprising in combination:

an integral rigid member having an outer covering member surface and an inner covering member surface;

said inner covering member surface defining an internal region in said covering member capable of receiving the trailer hitch ball;

said integral covering member being a relatively thin structure with the contour of said inner covering member surface being substantially similar to the contour of said outer covering member surface;

aperture means in said covering member defined by a plurality of resilient covering member fingers for enabling the trailer hitch ball to be received within said internal region of said integral covering member with said covering members fingers resiliently engaging the trailer hitch neck;

said resilient covering member finger being defined by a plurality of slots in said integral covering member; and

said aperture means being substantially smaller than the trailer hitch neck enabling said covering member fingers to be folded inwardly with the outside surface of each of said covering member finger resiliently engaging the trailer hitch neck and with the terminal ends of each of said resilient covering member fingers to resiliently engage the base of the trailer hitch ball.

4,181,321

COMBINED SKI BRAKE AND FASTENING DEVICE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements, Annecy, France

Continuation-in-part of Ser. No. 665,373, May 10, 1976, Pat. No. 4,062,553, which is a continuation-in-part of Ser. No. 557,476, Mar. 12, 1975, Pat. No. 3,989,271. This application Dec. 12, 1977, Ser. No. 859,932

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1974, 2412263; Jul. 26, 1974, 2436155; Feb. 2, 1975, 2507371

The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.

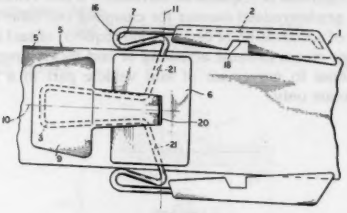
Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 **14 Claims**

1. In a pair of skis each having a runner surface, a top surface and a brake attached to said top surface by pivotal mounting means for swinging about a generally horizontal axis, said brake including a pair of laterally resiliently displaceable blades which straddle the ski and are displaceable between a retracted position above the level of said runner surface and a downwardly inclined position.

the improvement wherein each of said blades of one of said skis has an inner edge formed with a substantially transverse shoulder facing said axis, said shoulders being engageable by respective outer blade edges of the other of said skis with outward resilient displacement of the blades

of said one ski and inward resilient displacement of the blades of said other ski for locking said skis together upon



a positioning thereof back-to-back with their runner surfaces contacting each other.

4,181,322

WHEEL SUSPENSION ARRANGEMENT FOR MOTOR VEHICLES

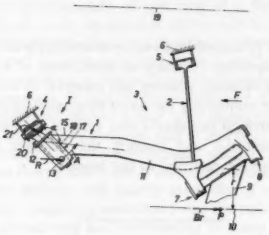
Wilhelm Kroniger, Müncheingen-Kallenberg, Fed. Rep. of Germany, assignor to Firma Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,802

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645272

Int. Cl.² B60G *11/08*

U.S. Cl. 280—699 **12 Claims**



1. A wheel suspension arrangement for motor vehicles of the type including a wheel guide linkage arranged swingably at the vehicle body for supporting a wheel carrier in the vehicle longitudinal direction; said suspension arrangement comprising:

elastic means for enabling horizontal transverse movement of the wheel guide linkage, said elastic means including a rear guide rod formed of a flexibly bending elastic element and extending from a rear pivot bearing at the vehicle body to the wheel carrier,

and a front guide rod arm assembly, said front guide arm assembly being formed of first and second front guide rod members hingedly connected to one another, said front guide rod arm assembly extending from said wheel carrier to a position disposed forwardly of said rear pivot bearing, and said guide rod members being pivotal about at least an essentially vertical pivot axis.

4,181,323

AIR SPRING AND PARALLELOGRAM SUSPENSION

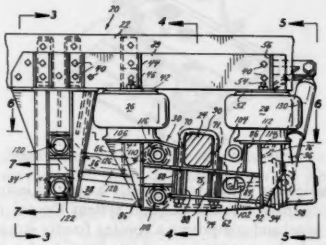
John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Continuation-in-part of Ser. No. 728,867, Oct. 1, 1976, Pat. No. 4,114,923. This application Feb. 9, 1978, Ser. No. 876,220

Int. Cl.² B10K *23/00*

U.S. Cl. 280—711 **16 Claims**

1. A suspension assembly for supporting a vehicle chassis on a vehicle axle comprising a hanger depending from the chassis and rigidly supported thereto to form a member thereof, an axle seat spaced longitudinally from the hanger, said vehicle axle being ridigly mounted to the axle seat, the axle seat having a portion extending from the axle and toward the hanger and a portion extending from the axle and away from the hanger, air springs located on the same side of the hanger as the axle seat and mounted between the extended portions of the axle seat and chassis for resiliently resisting movement of the axle and axle seat during loading and unloading of the axle, and parallelogram means mounted between said chassis and said axle seat maintaining the pitch of the axle and axle seat constant during loading and unloading of the axle, said parallelogram means further comprising at least two rods each having one end pivotally mounted to said hanger, the portion of said axle seat extending toward the hanger defining a pocket for receipt of the other ends of said rods, said other ends of said rods being pivotally mounted within said pocket one above the other in spaced vertical relation.



4,181,324

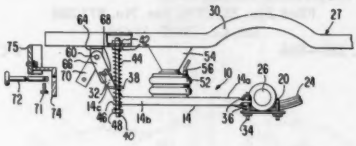
OVERLOAD STABILIZER UNIT FOR VEHICLE

William K. Hixon, One Scott Ct., Scotts Valley, Calif. 95066

Filed Oct. 6, 1977, Ser. No. 839,878

Int. Cl.² B60G *11/62*

U.S. Cl. 280—713 **16 Claims**

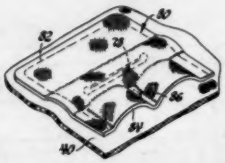


14. In a vehicle having an axle and a pair of spaced fore and aft frame members, the combination with said axle and said frame members of: a pair of mounting rods; means coupled with each mounting rod, respectively, for pivotally connecting one end of the rod to the vehicle near a respective end of the axle with the rod extending away from the axle; a cross rod connecting the opposite ends of the mounting rods together; inflatable means carried by each mounting rod, respectively, and connected to a respective frame member for applying a downward force on the corresponding mounting rod and thereby the axle; a clamp rod having means at the end thereof for rotatably mounting the same on the vehicle; and means carried by the clamp rod for engaging and supporting the cross rod after the clamp rod has been rotated relative to the vehicle through a predetermined arc, whereby the cross rod is releasably secured to the frame members at a location spaced from said axle to substantially prevent relative movement between the cross bar and the vehicle as the inflatable means of each mounting rod applies said downward force.

4,181,325
OCCUPANT RESTRAINT CUSHION

Ronald R. Barnett, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 883,895, Mar. 6, 1978. This application Jan. 19, 1979, Ser. No. 4,759
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—739 1 Claim

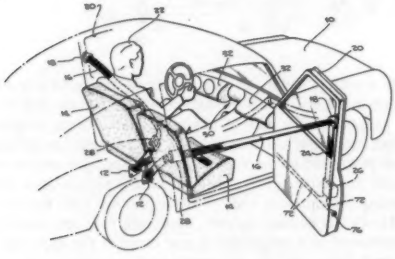


1. In combination with a vehicle body having an instrument panel, an occupant restraint cushion system located in said instrument panel and comprising a housing fixedly mounted to said vehicle body, a restraint cushion formed of a porous woven material and having at least two wall sections defining a compartment, a portion of said restraint cushion being secured to said housing, a gas generator located in said compartment for inflating said restraint cushion under predetermined conditions so as to cause the restraint cushion to be deployed outwardly relative to said instrument panel, one of said wall sections of said restraint cushion having a slit formed therein, and a patch located within said compartment covering said slit and fixedly connected to the associated wall section so as to provide a passage to the slit when an obstacle prevents full deployment of said restraint cushion to thereby relieve the pressure within the restraint cushion and prevent full inflation thereof.

4,181,326
VEHICLE SENSING INERTIA REEL LOCKUP INHIBITORS

William M. Hollowell, Pacific Palisades, and Avraham Ziv, Sepulveda, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

Filed Jan. 25, 1978, Ser. No. 872,306
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—806 9 Claims



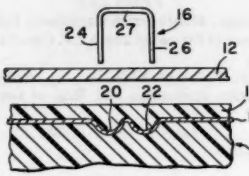
1. In a safety belt retractor of the emergency locking type having a safety belt wound on a spool rotably journaled in a retractor frame mounted to a part of a vehicle which is intentionally movable relative to the vehicle, such as the vehicle door, and inertia responsive locking means for locking the spool to prevent belt protraction in the event of an emergency condition, said locking means including an inertia sensor means for actuating said locking means in response to forces exerted thereon due to a rate of acceleration or deceleration thereof of more than a predetermined value, the improvement comprising the provision of:

means operated in response to movement of said vehicle part in a predetermined manner for changing the value of the rate of acceleration or deceleration required of said inertia sensor means to cause actuating of said locking means in response to movement of said vehicle part in a single direction only.

4,181,327
ASSEMBLING METHOD

Arthur A. Merrill, 25 Commodore Rd., Chappaqua, N.Y. 10514

Division of Ser. No. 782,633, Mar. 30, 1977, Pat. No. 4,119,332. This application May 11, 1978, Ser. No. 904,896
Int. Cl.[2] B42D *1/06*
U.S. Cl. 281—25 R 4 Claims



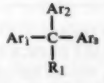
1. A method of assembling one or more sheets of material to a backing comprising: forming an anvil strip of high impact material in the backing, placing the material to be assembled over the binder containing the anvil strip, and forcing at least one fastener through the sheets into surface contact with the high impact material and causing the fastener to clench, thereby securing the material to the binder.

4,181,328
RECORDING ELEMENT

Masato Satomura; Masataka Kiritani, both of Fujinomiya, and Taiichi Nishimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 30, 1977, Ser. No. 838,179
Claims priority, application Japan, Sep. 30, 1976, 51/117719
Int. Cl.[2] B41M *5/22, 5/16*
U.S. Cl. 282—27.5 10 Claims

1. A recording element comprising a support having thereon a layer of microcapsules containing an electron donating organic color-former compound and at least one triarylmethane hydrocarbon compound as a solvent for the color former compound, wherein said triarylmethane hydrocarbon compound is represented by the general formula (I)



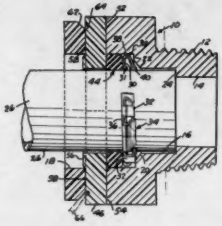
(I)

wherein Ar_1, Ar_2 and Ar_3, which may be the same or different, each represents an aryl group, which may be substituted with one or more substituents containing 4 carbon atoms or less; and R_1 represents a hydrogen atom or a substituent containing 4 carbon atoms or less.

4,181,329
RELEASABLE TUBE COUPLING

Homer E. Helm, Troy, Mich., assignor to Gordon H. Cork, Birmingham, Mich.

Filed Feb. 2, 1979, Ser. No. 8,558
Int. Cl.[2] F16L *37/12*
U.S. Cl. 285—3 20 Claims



1. A releasable tube coupling comprising a body having a stepped bore therein, said bore having an open end for receiving one end of a tube and also having a radially inwardly projecting annular shoulder facing said open end and spaced axially inwardly therefrom, a spring metal ring in said bore, said ring having a circumferentially continuous radially inwardly directed annular portion provided with a central aperture to enable the end of the tube to be inserted therethrough, said ring having a plurality of circumferentially spaced fingers thereon projecting axially from the outer periphery of said annular portion and adapted to engage said shoulder in said bore to limit displacement of said ring in a direction axially inwardly of said bore, an annular seal in said bore having one side thereof axially abutting said annular portion of the ring on the side thereof opposite said fingers, said seal having an inner diameter dimensioned to seal with the outer periphery of a tube inserted therethrough and an outer diameter dimensioned to seal with said bore, means in said bore engaging the opposite side of said seal for retaining the seal in said bore, said ring also having a plurality of circumferentially spaced fingers thereon connected at their radially outer ends with said annular portion and inclined radially and axially inwardly of said bore, said spring fingers extending inwardly from the radially outermost periphery of said ring and terminating in sharp edges at their free inner ends which are spaced radially inwardly of the edge of the central aperture therein, whereby said spring fingers are adapted to frictionally engage and bite into the outer periphery of a tube inserted through said ring to prevent its withdrawal from within said body, said spring fingers having a length substantially greater than the radial distance between the inner and outer peripheries of said ring and, therefore, being readily flexible so as to accommodate tubing which is out-of-round and also tubing which may be smaller or larger than a nominal specified size.

4,181,330
HORN SHAPED MULTI-INLET PIPE FITTING

Noriatsu Kojima, 31, Yanagishima-cho 5-chome, Nakagawa-ku, Nagoya, Aichi, Japan

Filed Mar. 22, 1977, Ser. No. 780,107
Int. Cl.[2] F16L *43/00*
U.S. Cl. 285—127 6 Claims

1. A pipe joint comprising:

a body having a substantially horizontal inlet of relatively large size and a substantially vertical outlet of relatively small size,

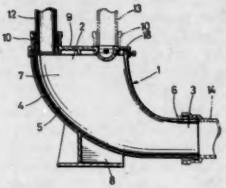
the outlet adapted to have an outlet pipe connected to it,

connecting cap means on said body at said inlet for connecting a pipe of small size compared to the inlet to said body and for effecting discharge of material from the pipe into the body adjacent the inlet thereof,

said body characterized by:

(a) a curved wall extending from said inlet and converging to said outlet and having a face thereof beneath the pipe for receiving material discharged from the pipe and changing the direction of movement thereof from substantially vertical to substantially horizontal, and

(b) a clearance space in said body laterally of the entrance for material discharged thereinto from the pipe, said

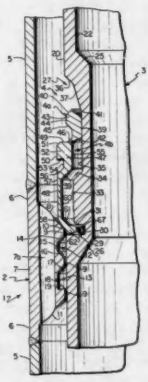


clearance space being free of impediment to the lateral movement of gases discharged from the pipe, thereby enabling gases associated with the liquid flowing into the joint from the pipe to be separated therefrom, and providing communication of both air and liquid between a pipe connected to the outlet, the pipe joint and a pipe connected to the inlet.

4,181,331
HANGER APPARATUS FOR SUSPENDING PIPES

William S. Cowan, West University Place, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Jun. 16, 1978, Ser. No. 915,902
The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—141 7 Claims



1. In a hanger apparatus for suspending an upright inner pipe from an outer pipe or other annular outer member, the combination of

a tubular hanger body to be carried by the outer member, said hanger body comprising

an upwardly directed transverse annular camming shoulder,

a transverse annular inwardly opening locking groove spaced below said camming shoulder, and

a transverse annular inwardly opening catching groove spaced below said locking groove;

a tubular hanger mandrel to be carried by the inner pipe, said mandrel having

an axialy elongated transverse annular outwardly opening recess,

a transverse annular upwardly directed stop shoulder at the lower end of said recess,

a transverse annular downwardly directed load-bearing shoulder at the upper end of said recess,

an annular outer surface portion of smaller diameter than said load-bearing shoulder and located below said load-bearing shoulder, and

an annular downwardly and inwardly tapering actuating surface between said load-bearing shoulder and said smaller diameter portion; and

an annular locking device carried by said mandrel, said locking device being disposed in said recess and comprising

annular resiliently contractable and expandable locking means including an outwardly projecting transverse annular locking rib and having a normal condition, when the locking means is relaxed and undistorted, such that the inner periphery of the locking means is smaller than said actuating surface, said locking means being initially disposed in a position surrounding said smaller diameter outer surface portion,

annular resiliently contractable and expandable catching means surrounding the mandrel, said catching means comprising a transverse annular outwardly projecting catching rib and a downwardly and inwardly tapering downwardly facing camming surface located below said catching rib, and

releasable retaining means releasably securing said catching means to the mandrel in a location between said locking means and said upwardly directed stop shoulder,

the diameter of said catching means, when said catching means is retained by said retaining means, being such that the outer diameter of said downwardly facing camming surface is larger than the inner diameter of said upwardly facing camming shoulder of the hanger body and the inner diameter of the catching means is larger than the outer diameter of the portion of the mandrel surrounded by the catching means;

lowering of the combination of the mandrel and locking device into the hanger body first causing said camming surface to engage said camming shoulder and compress said catching means to allow the same to enter the hanger body;

continued downward movement of the combination of the mandrel and locking device then causing the catching rib to engage in said catching groove and hold the catching means against further downward movement relative to the hanger body, whereby continued downward movement of the mandrel causes said retaining means to release the catching means;

further downward movement of the mandrel then causing said actuating surface to enter said locking means and, with the locking means restrained axially by engagement with the upper end of said catching means, cause said locking means to expand into locking engagement between a surface of said locking groove and said load-bearing shoulder of the mandrel.

4,181,332

FLEXIBLE PIPE CONNECTION

Joachim Neumann, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

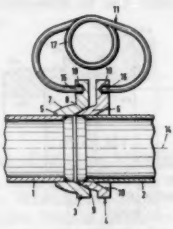
Filed May 26, 1977, Ser. No. 800,851

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623520; Mar. 10, 1977, 2710357; Apr. 16, 1977, 2716894

Int. Cl.[2] F16L *27/04*

U.S. Cl. 285—334.4 **12 Claims**

1. Apparatus for providing a releasable, flexible sealed connection between first and second pipes, said apparatus comprising: a spherical sealing surface projecting axially outwardly from an end of said first pipe; an axial accommodating space on an end of said second pipe for receiving said spherical surface, said axial accommodating space having a conical sealing surface for engaging said spherical sealing surface; first and second clamping structures rigidly attached to said first and second pipes, respectively, and at least one spring clamp having opposite ends directed toward each other and bottomed in



oppositely facing recesses on said first and second clamping structures to urge said spherical surface into said accommodating space, said spherical surface and said accommodating space cooperating to allow said pipes to swivel with respect to each other.

4,181,333

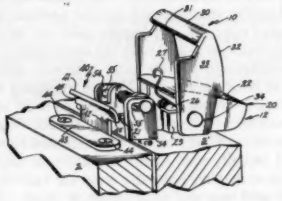
SASH LOCK

Gerard N. Stelma, Grand Rapids, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Mar. 31, 1978, Ser. No. 892,285

Int. Cl.[2] E05C *5/00, 9/14*

U.S. Cl. 292—66 **9 Claims**



1. A sash lock for two relatively movable components, such as double hung window, comprising:

a catch means on a first of the two relatively movable components for securing said sash lock to said first movable component;

a base means on a second of the two relatively movable components for securing said sash lock to said second movable component;

a latch mounted on said base means for engaging said catch means, said latch including an upper portion and a lower portion, each of said upper and lower portions engaging said catch means thereby securing the two relatively movable components to each other, said upper and lower portions being pivotally connected to each other and said lower portion being pivotally connected to said base means.

4,181,334

SAFETY CATCH

Angelo Fusi, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 9, 1978, Ser. No. 868,150

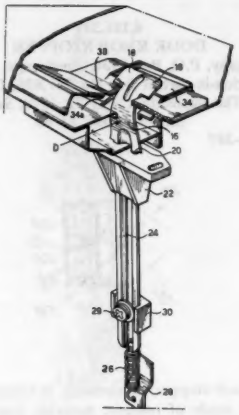
Claims priority, application Italy, Jan. 18, 1977, 67101 A/77

Int. Cl.[2] E05C *19/06*

U.S. Cl. 292—87 **4 Claims**

1. A safety catch for a frontally opening hood of a motor vehicle engine compartment comprising catch means adapted

to be fitted to a front sill of the engine compartment, complimentary seat means adapted to be secured at the front of the hood, said catch means comprising an elongated flexible resilient strip, support means guiding said strip for vertical movement, said strip having a curved upper end portion provided with two transverse tongues, said seat means comprising a

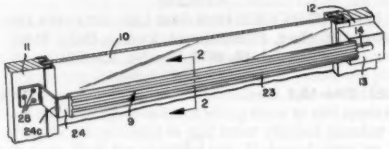


bracket adapted to be fitted to the lower surface of the hood, said bracket having an aperture for receiving the curved end portion having the tongues thereon and a recess in one edge of said aperture into which said strip will be biased by the resiliency of the strip after the tongues pass through said aperture, and elastic anchoring means for the lower end of the strip.

4,181,335
PUSH RELEASE DOOR OPENER

Laurence R. Thoren, R.D. #1, Canton, Pa. 17724

Filed Dec. 22, 1976, Ser. No. 753,141
Int. Cl.[2] E05C *15/02*; E05B *3/00*
U.S. Cl. 292—92 **1 Claim**



1. An easily installable push release door opener for aluminum storm and screen doors and the like having push handle latches comprising,

a push rail having a C-shaped cross-section with top and bottom grooves forming a track and having a first and second end,

an adjusting bar slidably attached through said first push rail end to the push rail and slidable in said track formed by said top and bottom grooves, said adjusting bar having a first end which is slidable in said track and a door-attaching end which extends away from the said push rail,

attaching means for mounting the door-attaching end of the adjusting bar onto the door,

connecting means mounted on said second push rail end for operatively connecting said push rail to the push handle of the door whereby body thrust of a person against the said push rail is effective to release the door latch and to open the door thereby releasing the hands of the person for other purposes,

wherein said adjusting bar is provided with a Z-shaped bend near its door-attaching end whereby the inherent resilience of said adjusting bar is enhanced and said push rail is offset from said door,

said adjusting bar being slidable in said track of said push rail for adjusting said door opener to the width of the door,

wherein means are provided for holding said push rail and adjusting bar in said adjusted position,

wherein said connecting means for connecting said push rail to the push handle of the door comprises an inverted U-shaped hook mounted on the push rail and placeable over the handle of the door and a stretchable O-ring for resiliently holding said inverted U-shaped hook and the door handle together,

wherein said adjusting bar has an inherent resilience and the mounting of the door-attaching end of said adjusting bar on the door is such as to utilize said inherent resilience normally to provide a biasing force on said push rail and the door push handle in a first direction such as to allow said handle to assume its door closing position,

said inherent resilience also allowing sufficient deflecting movement of said push rail upon application thereto of body thrust to push the handle of the door in the opposite direction to its door latch releasing position,

wherein said attaching means comprises screw means,

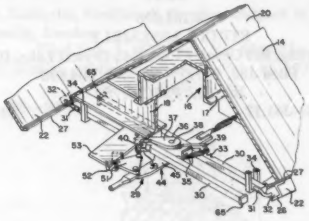
wherein the door-attaching end of said attaching bar is attachable to the door at a position that is substantially at the same level as the push handle on the door, and

said inverted U-shaped hook is in slidable attachment to said push rail.

4,181,336
HOPPER CAR CAM LOCK DOOR OPERATING MECHANISM

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 9, 1977, Ser. No. 859,066
Int. Cl.[2] E05C *17/18*
U.S. Cl. 292—262 **10 Claims**



1. For a railway hopper car having a car body, an underframe, a hopper structure including discharge openings, and downwardly and laterally outwardly movable discharge doors connected to said body at laterally opposite sides thereof, for opening and closing said discharge openings, the improvement of a door operating mechanism comprising;

a tension rod connected to each door,

said rods extending laterally inwardly and being spaced relatively longitudinally,

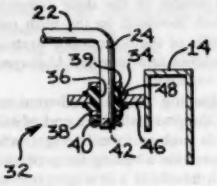
a cam lock supported on said car for pivotal movement about a vertical axis,

said cam lock including cam elements engageable with an inner portion of said tension rods in one pivotal position for locking said doors in a closed position,

said cam lock elements in a second pivotal position releasing said doors for outward swinging movement and engaging said tension bars in sliding relation, and

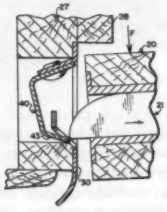
a longitudinal actuating member supported on said car for moving said cam lock and elements between said first and second position.

4,181,337
DOOR HOLDING APPARATUS
Thomas P. Muller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 17, 1978, Ser. No. 878,635
Int. Cl.[2] E05C *17/04*
U.S. Cl. 292—271 **4 Claims**



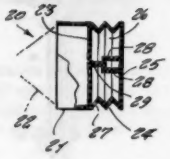
1. An apparatus (20) for holding a door (14) having a first aperture (48) in a preselected position relative to a door support (16) having a second aperture (30), comprising:
a U-shaped rod (22) having a midsection and opposite first and second ends (24,26), each end (24,26) having an axis substantially normal to the midsection;
first resilient grommet means (50) for receiving said second end (26) of the rod (22) and being disposed in a selected one of said first and second apertures (48,30); and
second resilient grommet means (32) for holding said first end (24) of the rod (22); permitting pivotal movement thereof, and exerting force against said first end (24) substantially in the direction of its longitudinal axis and urging said second end (26) substantially in the direction of its longitudinal axis and positively into forcible engagement with the first resilient grommet means (50), said second resilient grommet means (32) being disposed in the other one of said first and second apertures (48,30).

4,181,338
STRIKE ASSEMBLY
John G. Sterling, 888 Country Club Rd., Crystal Lake, Ill. 60014
Filed Jun. 9, 1977, Ser. No. 804,898
Int. Cl.[2] E05C *21/02*
U.S. Cl. 292—341.17 **14 Claims**



1. An emergency release strike assembly for use with a door lock or latch having an axially movable, spring-biased bolt, operably controlled by operator means for latching and unlatching cooperation with a jamb mounted strike, the operator means being selectively lockable to prevent operator controlled unlatching movement of the bolt whereby to lock an associated door in closed position, comprising: a rigid jamb mounted plate having a body portion formed with an opening for entry of the latching end of a bolt, bolt engageable catch means mounted adjacent said body portion for bolt engaging and disengaging movements behind said plate and across said opening whereby to respectively capture and release the latching end of a bolt extending into said opening; yieldable means operatively associated with said catch means to move the same to a bolt capturing position and reactive to the application of predetermined opening force on an associated door to cause movement of said catch means to a bolt releasing position whereby to release the captured end of the bolt, and means cooperable with said bolt for ejecting the released bolt from said opening.

4,181,339
DOOR KNOB STOPPER
Randle L. Rigsby, P.O. Box 8934, Anchorage, Ak. 99508
Continuation-in-part of Ser. No. 747,058, Dec. 3, 1976, abandoned. This application May 22, 1978, Ser. No. 908,526
Int. Cl.[2] E05C *21/00*
U.S. Cl. 292—347 **5 Claims**



1. A door knob stopper, comprising, in combination, a one-piece member made of resilient material, forming a hollow cover shaped to enclose a door knob, said member including a compressible bellows on its outward end, for absorbing a shock when said door knob is struck against a wall, and means to prevent axial torque between opposite ends of said bellows, when held in a hand for rotating said knob; said bellows comprising opposite end walls, a first of which comprises an outer end wall of said hollow cover, and an accordian-pleated circular side wall between the peripheral edges of said end walls, and an air vent opening through said side wall, said bellows normally being in an expanded position, so that said bellows enclose a compressible chamber; said means comprising said first end wall having a singular flat vane integral therewith, and projecting into said chamber.

4,181,340
LIFTING DEVICE FOR JAR LID ASSEMBLIES
Emanuel J. Kofford, 1905 Fillmore, Eugene, Oreg. 97405
Filed Jul. 14, 1978, Ser. No. 924,660
Int. Cl.[2] B66C *1/04*
U.S. Cl. 294—65.5 **2 Claims**

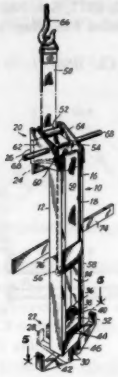
1. A device for lifting canning rings and lids from boiling water in which same are sterilized, said device comprising,
a magnetic body defining a central aperture extending therethrough,
an elongate handle of low heat conductance secured at one of its ends to said body within said aperture whereby said body may be submerged in boiling water to retrieve a lid or ring without risk of injury to the user.

4,181,341

APPARATUS FOR LIFTING SHEET MATERIAL

John R. Henke, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Mar. 3, 1978, Ser. No. 883,152
Int. Cl.[2] B66C 1/22
U.S. Cl. 294—67 R **4 Claims**



1. Apparatus for gripping and lifting sheet material comprising inner and outer elongated channel members slidably mounted to each other to permit telescoping movement of said channel members one into the other, first gripping means on the free end of one of said channel members and second gripping means on the other of said channel members, said first gripping means comprising a plate assembly mounted on one of said channel members and forming a U-shaped gripping unit having the elongated channel members as one of the legs of the U-shaped unit, said second gripping means comprising a plurality of U-shaped rotatable arms mounted in the free end of the other channel member, one of the legs of said U-shaped arms comprising a shaft and means for rotatably mounting each said shaft in said other channel member, each said shaft being rotatable between a first position in which the U-shaped arms project from said other channel member parallel to each other and to a plane which includes the longitudinal axis of said other elongated member and a second position in which said arms are splayed with respect to said plane for gripping said sheet material against the elongated channel member, detent means for retaining said arms in said first position to permit the placement of the apparatus on said sheet material, said detent means releasing upon the application of lifting force to said apparatus, and spring means mounted in said other channel member and to each said shaft for rotating said U-shaped arms to said splayed position upon release of said detent means; offset roller means and anchoring means in said one channel member, return roller means in the other of said channel members, and an elongated web extending into said apparatus through said offset roller means, around said return roller and to said anchoring means whereby lifting force applied to said elongated web will telescope said channel members to grip and permit lifting of sheet material between said first and second gripping means.

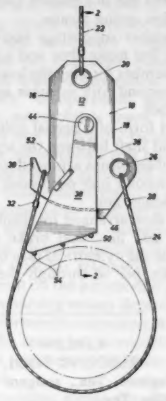
4,181,342

SELF RELEASING SLING HOIST

Charles F. Funk, Gulfport, Miss., assignor to Met-L-Parts, Inc., Gulfport, Miss.

Filed Feb. 21, 1978, Ser. No. 879,122
Int. Cl.[2] B66C 1/12
U.S. Cl. 294—75 **4 Claims**

1. A self releasing sling hoist comprising a body for attaching to a hoist, a hook attached to the body, a sling having one end attached to the body and the other end having an opening for receiving the hook to support a load below the body, and means for moving the end of the sling off the hook to release the load when the downward movement of the load is stopped and the body is lowered toward the load, said releasing means



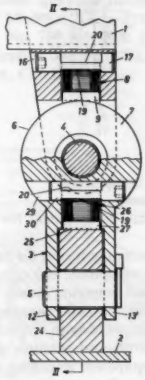
including a releasing arm pivotally attached to the body and extending below the body in position to engage the load and to be pivoted relative to the body by the load in an arcuate path past the hook forcing the end of the sling off the hook as the body moves toward the load.

4,181,343

OSCILLATING MOVEMENT DAMPING MEANS INTENDED FOR PIVOTALLY SUSPENDED HOISTING GEAR

Jonas H. Lindqvist, Hudiksvall, Sweden, assignor to Hiab-Foco Aktiebolag, Sweden

Filed Feb. 2, 1978, Ser. No. 874,623
Claims priority, application Sweden, Feb. 17, 1977, 7701750
Int. Cl.[2] B66C 1/00
U.S. Cl. 294—86 R **8 Claims**



1. An improved oscillating movement damping means for a hoisting device, comprising a link in which said hoisting device is suspended, a first horizontal shaft pivotally mounting the upper end of said link to the outer end of a lifting means, such as a crane jib, a second horizontal shaft pivotally mounting said hoisting device to the lower end of said link, the vertical longitudinal medium plane of said second shaft forming an angle,

preferably a right angle, to the vertical longitudinal medium plane of said first shaft, the improvement comprising

a first hub in the form of a partial cylinder provided at the upper part of said link,

a first brake shoe arranged to press against the cylindrical face of said first hub in a manner known per se through the action of a first spring means,

a first fork member supporting said first horizontal shaft housing said first brake shoe and said first spring means,

a second fork member forming the lower end of said link, the legs of said second fork member supporting said second horizontal shaft,

a second hub in form of a partial cylinder being journalled on said second shaft between the legs of said second fork member, a holder means arranged to suspend said hoisting device, said second hub positioned on the upper end of said holder means, and

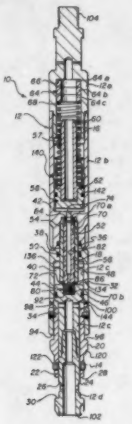
a second brake shoe arranged for displacement between the fork legs of said link, said brake shoe arranged to be pressed against the cylindrical face of said second hub in a manner known per se through the action of a second spring means.

4,181,344

RUNNING TOOL

Imre I. Gazda, Saginaw, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 23, 1978, Ser. No. 908,714
Int. Cl.² E21B *23/04;* F16F *9/18*
U.S. Cl. 294—86.18 **8 Claims**



1. A running tool comprising:

elongate body means;

means carried by said body means for engaging well equipment;

said body means including means for maintaining said engaging means in an equipment engaging position and means for permitting said engaging means to release equipment;

carrier means for carrying said engaging means on said body means and telescopable with respect to said body means between a first collapsed position wherein said engaging means is in an equipment engaging position and a second extended position wherein said engaging means is permitted to release equipment;

means for yieldably urging said carrier means to its first position; and

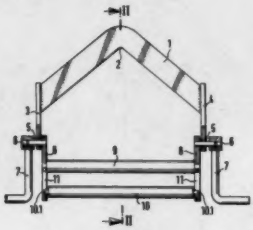
energy dissipation means for preventing the full magnitude of an impulsive force tending to move said carrier means towards its second extended position from being applied to said yieldable urging means and for permitting a steady force tending to move said carrier means towards its second position to overpower said yieldable urging means.

4,181,345

LIFTING TACKLE FOR FILLED SACKS

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,380
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646493
Int. Cl.² B66C *1/10*
U.S. Cl. 294—103 R **10 Claims**



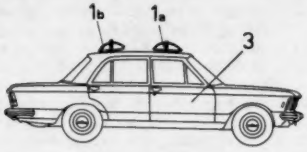
1. Apparatus for lifting a filled sack comprising a pair of clamping rods (**9, 10**) around which the gathered and flattened end of the sack is slung, the clamping rods being mounted in a supporting device (**1**) to pivot about an axis (**6.1**) which is parallel to and spaced from longitudinal axes of the clamping rods, one clamping rod (**10**) being easily displaceable towards the other (**9**), the other clamping rod (**9**) being secured at both ends to plates (**8**) having grooves (**11**) in which the displaceable clamping rod (**10**) is mounted for displacement and loose rotation, and pins (**6**) secured to the plates (**8**) and loosely rotatably mounted in said supporting device (**1**).

4,181,346

AERIAL-STABILIZER RUDDER FOR VEHICLES

Vincenzo Ainis, Via Bari 39/21, Genova, Italy

Filed Jul. 8, 1977, Ser. No. 813,967
Claims priority, application Italy, Jul. 12, 1976, 1274 A/76
Int. Cl.² B62D *37/02*
U.S. Cl. 296—1 S **9 Claims**



1. In combination, a vehicle and an aerial stabilizer for mounting onto said vehicle to counteract centrifugal forces tending to skid the vehicle when the vehicle is moving forward and changes directions, comprising in combination:

a fixed vertical support operable to be secured to the top of said vehicle above the center of gravity of said vehicle;

a rudder pivotably supported along a central portion on said fixed vertical support, and having a normally forward and a normally rearward portion, said rudder being responsive to air pressure externally of said vehicle when moving to turn said rudder to one side;

biasing means operatively associated with the rearward portion of said rudder and operable to bias said rearward portion of said rudder outwardly and toward a forward

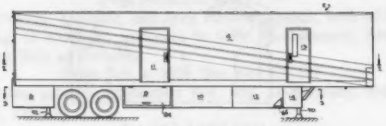
direction about said fixed support upon angular change of direction of said support.

4,181,347

MOBILE COMPUTERIZED TOMOGRAPHY UNIT

Ronald G. Clark, Gainesville, Fla., assignor to Synergetics, Inc., Gainesville, Fla.

Filed Aug. 22, 1977, Ser. No. 826,527
Int. Cl.[2] B62D *39/00*; B60P *3/00, 3/32*
U.S. Cl. 296—1 R **12 Claims**



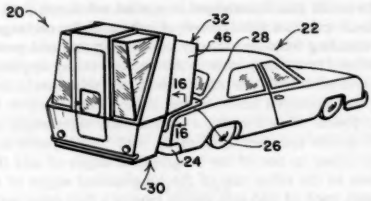
1. A mobile computerized tomography unit comprising:
a vehicle trailer;
a CT-scanner gantry and patient table
means for mounting the CT-scanner gantry and patient table as a unit and to prevent shock vibration from being transmitted to the CT-scanner gantry and patient table during travel of mobile unit;
a mini-computer system for display and data processing of the CT-scanner mounted in the trailer;
means for mounting the mini-computer components to prevent shock vibration from being transmitted to each mini-computer component;
means for cooling the X-ray tube of the CT-scanner and
means for rigidly supporting the unit when the van is stationary.

4,181,348

TRUNK-MOUNTABLE CAMPER CAPSULE FOR AUTOMOBILES

William N. Whitley, 19315 Shaker Blvd., and James M. Whitley, 2963 Morley, both of Shaker Heights, Ohio 44122

Filed Feb. 22, 1978, Ser. No. 880,083
Int. Cl.[2] B60P *3/30*
U.S. Cl. 296—165 **19 Claims**



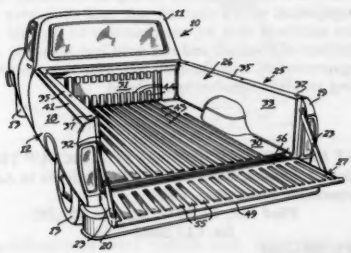
1. A trunk-mountable camper capsule for automobiles, comprising:
(a) compartment-defining means, including:
(i) an upstanding frame having spaced side walls with top and bottom walls extending transversely between and interconnecting its side walls to define four walls of a "primary" compartment adapted to be positioned rearwardly of the trunk compartment of an automobile;
(ii) a forwardly-extending structure having spaced side walls with top and bottom walls extending transversely between and interconnecting its side walls to define four walls of a "secondary" compartment adapted to overlie the trunk compartment of an automobile;
(iii) the upstanding frame additionally including a forwardly-facing wall which interconnects the two bottom walls, and a rear wall interconnecting the side walls and the top and bottom walls of the frame;
(iv) the forwardly-extending structure additionally including a front wall interconnecting the side walls and the top and bottom walls of the structure;
(v) the side walls and the top walls of the frame and the structure being rigidly interconnected to communicate the "primary" and "secondary" compartments;
(b) mounting means for releasably mounting the camper capsule about the trunk compartment of an automobile with the "primary" compartment positioned along the rear side of the automobile's trunk compartment at a location wherein the forwardly-facing wall is spaced rearwardly of the automobile's rear bumper and with the "secondary" compartment positioned at a location above the automobile's trunk compartment at a location wherein the secondary compartment's bottom wall is spaced above the automobile's trunk lid, the mounting means including bumper mounting means extending forwardly from the forwardly-facing wall for releasably mounting the "primary" compartment on the automobile's rear bumper, and including body mounting means depending from the bottom wall of the forwardly-extending structure for releasably mounting the secondary compartment on the automobile's trunk at locations on opposite sides of the automobile's trunk lid;
(c) the capsule providing means for sleeping two adults, whereby:
(i) the bottom wall of the forwardly-extending structure extends substantially horizontally when the capsule is mounted about the trunk compartment of an automobile, and provides a first bed platform adapted to sleep a first adult lying transversely thereon;
(ii) a cot means is provided within the compartment-defining means including structure movable between a storage position located along one of the walls of the compartment-defining means and a sleeping position extending through the "primary" compartment between the side walls and the rear and forwardly-facing walls thereof to provide a second bed platform adapted to sleep a second adult lying transversely thereon.

4,181,349

TRUCK BED LINER

Edwin L. Nix, 733 Tahlena Ave., and Bobby E. Davenport, 317 Beckley Dr., both of Madison, Tenn. 37115

Continuation of Ser. No. 769,580, Feb. 17, 1977, Pat. No. 4,111,481. This application Jul. 31, 1978, Ser. No. 929,738
Int. Cl.[2] B62D *33/02*
U.S. Cl. 296—39 R **6 Claims**



1. A protective liner for a truck bed having a bottom wall, a front wall, and opposed side walls, said bottom wall comprising a plurality of transversely spaced longitudinal rib members extending front-to-rear of the truck bed, comprising:
(a) bottom liner wall adapted to rest upon and to cover the bottom wall of said truck bed,
(b) said bottom liner wall comprising transversely spaced,

front-to-rear extending, raised, ridge members opening downward,

(c) there being one ridge member for each rib member, each ridge member being in substantial longitudinal alignment with each corresponding rib member,

(d) the width of each ridge member being greater than the width of the corresponding longitudinally aligned rib member to provide longitudinal ventilating spaces between said ridge members and the bottom wall of said truck bed when said bottom liner wall covers said bottom wall.

4,181,350

PANE COVER DEVICE, PARTICULARLY FOR WINDSHIELDS AND WINDOWS OF MOTOR VEHICLES

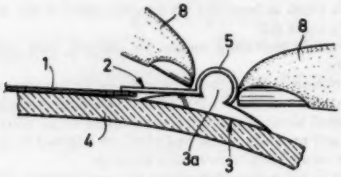
Wolfgang Eichstaedt, Brunnenweg 18, D-3331 Bad Helmstedt, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,291

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615567

Int. Cl.² B60T *1/20*

U.S. Cl. 296—95 C **3 Claims**



1. A pane cover for windshields and windows of motor vehicles comprising a covering sheet, at least one reinforcing bar attached at each of two opposite ends of said sheet, each reinforcing bar extending along the length of its corresponding sheet end and having a thin flexible channel facing inwardly toward the glass and having a mouth portion narrower than an interior portion, and each channel having a pair of outwardly projecting spaced apart actuating legs extending along its length, said legs having inner edges connected and formed integrally with the back of the channel so as to have a lever action when manually pressed together along their outer edges whereby to open said channel mouth portion, said legs when released manually allowing the mouth portion to close, and a pair of mounting strips attached to the motor vehicle in spaced relationship for cooperation with the channels of the reinforcing bars whereby to hold the covering sheet in position over the pane, each mounting strip having an outwardly facing rib for engagement with a channel, and each rib having an inner portion narrower than an outer portion to provide for snap engagement of channels and ribs with legs manually released, disengagement of said channels and ribs being achieved by pressing said legs together as aforesaid.

4,181,351

FLAT BED CONVERSION KIT FOR PICKUP TRUCKS

Theodore J. Spanke, Bakersfield, Calif., assignor to Add-a-Bed Corporation, Bakersfield, Calif.

Filed Dec. 12, 1977, Ser. No. 859,385

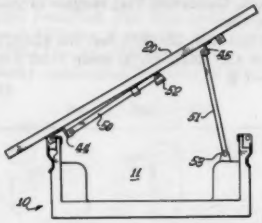
Int. Cl.² B60J *7/10*

U.S. Cl. 296—100 **9 Claims**

1. A hinged, removable flat-bed conversion kit for pick-up trucks, said kit comprising:

first and second support rails affixed to the longitudinal sides of a pick-up truck box, at least one of said support rails having a plurality of one of a set of pin and eye supports affixed thereto below the upper surface of said rail;

a flat-bed extending over both support rails and having a plurality of mating pin and eye supports positioned near the outer edge of the flat-bed and extending from the lower surface of the bed and positioned to be securely engaged with and be held by the pin and eye support members of the support rails and to provide a combined latch and hinge action; and



means for moving the pin and eye support members apart along at least one rail, whereby the flat-bed may be raised along one edge while hinged along the opposite edge to permit the pick-up box to be accessible from the top thereof.

4,181,352

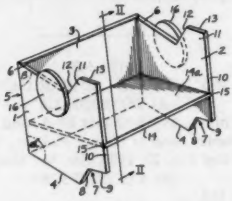
CHILDREN'S FURNITURE PIECE

Gary Bumpus, Columbus, Ohio, assignor to Michael D. Newland, Dayton, Ohio, a part interest

Filed Nov. 9, 1978, Ser. No. 959,166

Int. Cl.² A47C *13/00*

U.S. Cl. 297—3 **5 Claims**



1. A multi-purpose children's furniture piece which comprises: two side panels arranged in spaced relationship to and facing each other, a third panel of substantially rectangular shape extending from and fixedly connecting one end portion of one of said two side panels to the corresponding oppositely located end portion of the other one of said side panels, and a fourth panel arranged between and fixedly connected to said two side panels while forming a substantially right angle with said side panels and said third panel, said fourth panel being arranged closer to one of the longitudinal edges of said third panel than to the other one of the longitudinal edges of said third panel, each of said side panels having a first edge and an oppositely located second edge and also having a third edge located adjacent said third panel and interconnecting one end of said first and second edges on the respective side panel, each of said side panels also having a fourth edge spaced from the other end of said first and second edges and located opposite the pertaining third edge, said first and third edges of each of said side panels forming an obtuse angle with each other and said second and third edges of each side panels defining an acute angle with each other which latter is supplementary to the pertaining obtuse angle so that said first and second edges are on each side panel substantially parallel to each other, each of said other ends of said first edges being spaced from said fourth edge by a step in the respective side panel, said step being defined by a first step section connected to the respective pertaining first edge and by a second step section interconnecting said first step section with said fourth edge, each other end

of said second edges being spaced from said fourth edge by a panel projection having a first projection section connected to the respective pertaining end of said second edge and being substantially parallel to said first step section, each of said projections also having a second projection section interconnecting the pertaining first projection section with said fourth edge and being substantially parallel to said second step section of the same side panel, and projecting means projecting from the outside of said panels beyond the pertaining second edges.

4,181,353
VEHICLE SEAT

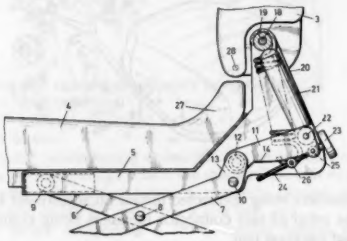
Gerd Grass, Detmold, and Jorg Hettich, Lemgo, both of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,337

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704921

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—307 **6 Claims**



1. A resiliently-mounted vehicle seat, comprising a seat frame, a seat cushion carried by said seat frame, an underframe joined to said seat frame, a scissors linkage located at each side of said underframe and supporting the seat frame from said underframe, each of said scissors linkages including pivotally connected links, a pivot pin connecting the links of each scissors linkage at their point of intersection, at least one of the scissors linkages having an extension piece joined to one of its links that projects rearwardly from a pivot by which the last named link is pivotally attached to said seat, a shock absorber extending between the free end of the extension piece and a first shaft that is rotatably mounted on said seat frame and that is spaced from said extension piece, said extension piece having a cam surface formed thereon, a slidable shaft engaging and movable along said cam surface, and a tension spring pivotally attached to the slidable shaft and to said first shaft and defining with said shock absorber a spring and damping unit that is adjustable by said slidable shaft to provide for location of said seat frame in accordance with the occupant of said seat.

4,181,354
VEHICLE SEAT

Gerd Grass, Detmold, and Jörg Hettich, Lemgo, both of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

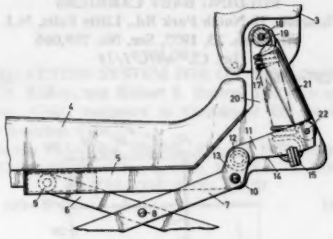
Filed Feb. 1, 1978, Ser. No. 874,338

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704919

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—307 **5 Claims**

1. A resiliently-mounted vehicle seat, comprising a seat frame; a seat cushion carried by said seat frame, an underframe connected to said seat frame; a linkage at each side of the underframe supporting the seat from the underframe, at least one of said linkages including an extension piece joined thereto which has a guide edge formed thereon; a spring and damping unit including tension springs interposed between said linkages and said seat, a shaft to which one end of each spring is pivotally connected, said guide edge as formed on an extension piece being in the form of an arc, the axis of the radius of curvature of which is defined by said shaft, a bar engaging said guide edge and extending transversely of said guide edge for movement therealong, said springs being located on both sides of the extension piece and engaging said bar for urging said bar against said guide edge, said bar including hinged sections that define a clamping groove therebetween and in which said guide edge is received, said hinged sections being movable in a pincer-like manner upon application of a load to said seat frame



to grip the extension piece, and stop yokes located at the outer sides of said springs and being pivotal about said shaft for engagement with the outer ends of said bar, said stop yokes having an effective length somewhat greater than the radius of curvature of said guide edge and the unloaded condition of the seat frame, wherein said bar is movable along said guide edge in an unloaded condition of said seat frame, while in the loaded condition of said seat frame, said bar grips the extension piece to determine the point of application of said springs on the extension piece and the moment exerted on the linkage by said springs.

4,181,355
VEHICLE SEAT

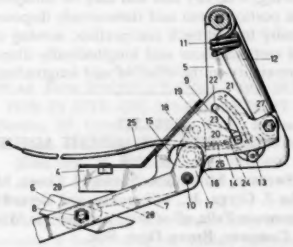
Gerd Grass, Detmold, and Jörg Hettich, Lemgo, both of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,339

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704920

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—307 **3 Claims**



1. A resiliently-mounted vehicle seat, comprising a seat frame, a seat cushion carried by said seat frame, an underframe joined to said seat frame, a scissors linkage located at each side of said underframe and supporting said seat frame from said underframe, said scissors linkage including interconnected links, a pivot pin connecting the links of each scissors linkage at their points of intersection, at least one of the links of each scissors linkage having an extension piece joined thereto which extends beyond a pivot by which one link is pivotally attached

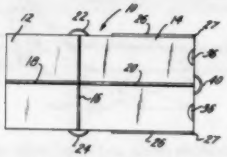
to said seat frame, a spring and damping unit including tension springs and a shock absorber, said spring and damping unit being engageable with said extension piece and said extension piece being pivotal about the pivot for said one link when a load is applied to said seat frame, and means interconnected to said scissors linkage for locking said linkage in an adjusted position and for releasing said linkage for movement to an adjusted position for locating said seat frame in a desired position of use.

4,181,356

FOLDING BABY CARRIERS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Filed Jan. 13, 1977, Ser. No. 759,066
Int. Cl.[2] A47C *1/14*
U.S. Cl. 297—350 **18 Claims**



1. A seat for infants comprising, in combination, a seat portion including a front end and a rear end and a pair of side portions connecting said front and rear ends, a back rest portion including an upper end and a lower end and a pair of side portions connecting said upper and lower end portions, a pair of coaxial and transversely disposed hinges, each hinge having one of its ends running from a said side portion and its other end terminating substantially midway the width of said seat and back rest portions and hingedly connected along peripheral portions of the rear end of said seat portion and the lower end of said back rest portion thereby directly connecting said seat and back rest portions to each other, and a first longitudinally disposed hinge disposed intermediate and substantially midway between said sides of and running the length of the seat portion thereby dividing the seat portion into two substantially rigid one-piece longitudinal sections, and a second longitudinally disposed hinge disposed intermediate the sides of and running the length of the back rest portion, thereby dividing the back rest portion into two substantially rigid one-piece longitudinal sections, said seat portion and said back rest portion being adapted to support an infant without buckling and without bowing, whereby said seat may be collapsed by moving said seat portion about said transversely disposed hinge in close proximity to said back rest portion, moving one of said longitudinal sections about said longitudinally disposed hinge into close proximity to the other of said longitudinal sections.

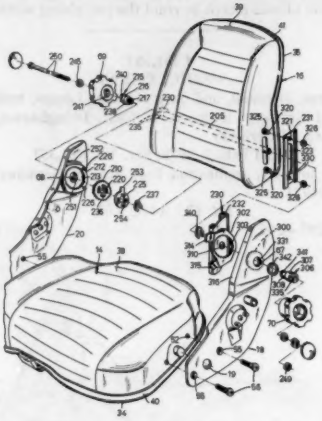
4,181,357

SEAT BACKREST TILT AND HEIGHT ADJUSTMENT MEANS

Richard F. Swenson, Milwaukee; Shawn H. Eimen, Menomonee Falls; John J. Gryga, Jr., Milwaukee, and Gerard E. Schommer, Menomonee Falls, all of Wis., assignors to Milsco Manufacturing Company, Brown Deer, Wis.

Filed Mar. 20, 1978, Ser. No. 888,555
Int. Cl.[2] A47C *1/022, 1/025*
U.S. Cl. 297—353 **8 Claims**

1. In a vehicle seat:
a seat assembly including a seat pan;
a backrest assembly including a backrest pan;
backrest height adjustment means connected between said seat pan and said backrest pan and including a height adjustment knob and means for locking said backrest pan at a predetermined height;
and backrest tilt adjustment means connected between said seat pan and said backrest pan and including a tilt adjustment knob and means for locking said backrest pan at a predetermined tilt;
said tilt adjustment means further including a connector assembly connected to and tiltable in response to rotation of said tilt adjustment knob and including a pair of relatively slideable connector members, one of said connector



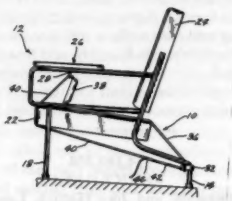
members being connected to said tilt adjustment knob and the other of said connector members being connected to said backrest pan;
whereby said backrest pan can be tilted regardless of the vertical position relative to said seat pan wherein it is locked and can be moved vertically regardless of the tilted position relative to said seat pan wherein it is locked.

4,181,358

PATIENT RESTRAINT FOR USE ON A CHAIR OR THE LIKE

Ramona K. Pennington, 358 N. 41st St., Omaha, Nebr. 68131

Filed Mar. 1, 1978, Ser. No. 882,343
Int. Cl.[2] A47C *27/00, 31/00*
U.S. Cl. 297—467 **8 Claims**



1. In combination,
a chair means having at least a pair of supporting leg members at its rearward end, a back portion, a seat portion and a tray means positioned above the seat portion,
a support means secured to the pair of supporting leg members and extending therebetween,
a flexible sheet member secured at its rearward end to said support means and extending upwardly therefrom forwardly over the said seat portion,
said sheet member having a forward end portion adapted to be positioned between a person's legs and extended upwardly therebetween,
an elongated flexible strap means secured to said forward end portion and extending upwardly therefrom for con-

nection with the tray means, thence downwardly beneath said seat portion and being connected to said support means.

4,181,359

SEAT BELT ANCHORAGE ASSEMBLIES

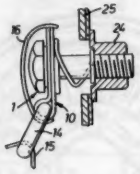
Andrew L. Ward, 15 Douglas Rd., Standish, Wigan, Lancashire WN6 0QT, England

Filed Nov. 3, 1977, Ser. No. 848,353

Claims priority, application United Kingdom, Nov. 4, 1976, 45963/76

Int. Cl.[2] A62B *35/00*; A44C *5/18*

U.S. Cl. 297—468 **1 Claim**



1. A seat belt anchorage assembly comprising:
a screw-threaded bolt,
said bolt having a head and a shank,
bracket means,
said bracket means having a plate portion, an aperture in said plate portion through which the shank of the bolt extends, whereby the bracket means is rotatably carried on the bolt, and means for receiving a seat belt, and
spring means comprising a frusto-conical helical spring surrounding said shank and having the larger end thereof abutting said plate portion around said aperture, and the smaller end thereof in gripping engagement with said shank to hold the components of the assembly together.

4,181,360

CUTTING FORCE SENSOR

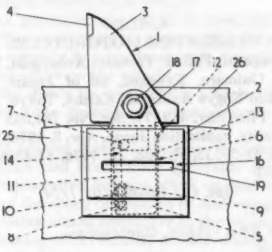
Raymond G. Wilson, Tamworth, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 3, 1973, Ser. No. 403,219

Claims priority, application United Kingdom, Oct. 10, 1972, 46570/72

Int. Cl.[2] E21C *39/00*

U.S. Cl. 299—1 **9 Claims**



1. The mineral cutting machine sensing apparatus comprising a cutter head mounted for rotation on a machine, a pocket in the cutter head, a cutter having a shank mounted in the pocket on the cutter head, the cutter having a cutter blade mounted at a distal forward end of the cutter pivot means mounted on the cutter transverse to the cutter at a medial portion of the cutter, and wherein the compressible botton is mounted between a front wall of the pocket and a proximal frontal portion of the cutter shank for compressing the botton as cutting force rearward on the cutter blade pivots the cutter about the pivot means, a sensor in the compressible button member for producing electrical signals upon relative movement of the cutter shank and the pocket, wires connected to the sensor, and a radio transmitter mounted on the cutter head and connected to the wires for accepting the electrical signals from the sensor and transmitting radio signals representative of the electrical signals.

4,181,361

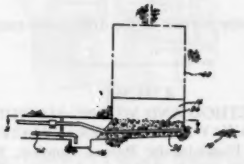
GAS COLLECTION SYSTEM FOR OIL SHALE RETORT

Richard D. Ridley, and Robert S. Burton, III, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 496,969, Aug. 13, 1974, abandoned. This application Dec. 6, 1976, Ser. No. 747,738

Int. Cl.[2] E21C *41/10, 43/00*

U.S. Cl. 299—2 **15 Claims**



1. A method for forming an in situ oil shale retort in an underground oil shale formation, comprising the steps of:
forming a tunnel ino the oil shale,
excavating a chamber in the oil shale at the end of the tunnel,
placing a plurality of pipes adjacent the bottom of the chamber, the pipes extending into the tunnel and having openings within the chamber; and
blasting oil shale particles from overlying oil shale formation above the chamber to enlarge and fill the chamber with broken oil shale particles.

4,181,362

LIQUID SEAL FOR PRODUCTION LEVEL BULKHEAD FOR IN SITU OIL SHALE RETORT

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

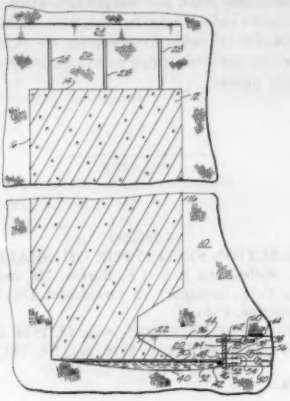
Filed Sep. 11, 1978, Ser. No. 941,009

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—2 **19 Claims**

1. A liquid seal for closing the bottom of an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale comprising:
a drift extending laterally away from a lower level of the fragmented mass;
a bulkhead placed across the drift for inhibiting gas flow from an inside portion of the drift adjacent the fragmented mass to an outside portion of the drift on a side of the bulkhead opposite the fragmented mass, the bulkhead having a lower edge extending across a floor of the drift; and
a pool of liquid on the floor of the drift maintained at a

sufficient level against the surface of the bulkhead to seal the lower edge of the bulkhead against the passage of gas



from the inside portion of the drift to the outside portion of the drift.

4,181,363

MINING METHOD AND MINING MACHINE FOR CUTTING AWAY HARD MINERAL MATERIALS

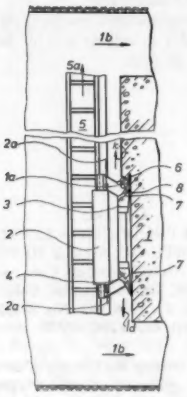
Heinrich Goris, Hamminkeln; Roland Gunther, Wesel; Kurt Ogorek, Oberhausen; Karl-Heinz Schwarting, Voerde, and Wilfried Witulski, Unna, all of Fed. Rep. of Germany, assignors to Gutehoffnungshutte Sterkrade A.G., Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,953

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713781

Int. Cl.[2] E21C *27/34, 25/60*

U.S. Cl. 299—17 **21 Claims**



1. A method of mining particularly hard mineral raw materials using a pivotal fluid pressure jet and a percussion device for undercutting the mineral comprising undercutting the mineral by directing the high pressure fluid jet without interruption at an even rate in the mining direction while swinging the jet upwardly and downwardly in a vertical plane lying at an acute angle to the face being mined and directing the percussion instrument so as to mine away the mineral of a selected thickness in coordination with the action of the fluid jet by engaging the percussion instrument in the mineral and performing pivotal motions in a horizontal plane and following the action of the percussion instrument with the fluid jets to break away the minerals engaged by the percussion tool.

4,181,364

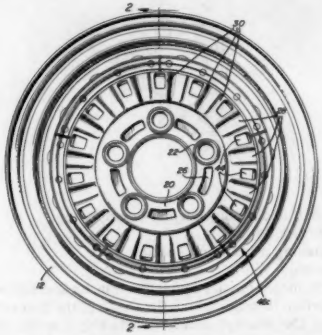
STRENGTHENING MEANS FOR DECORATIVE AUTOMOTIVE WHEEL CENTERS

Merlyn R. Reppert, Rancho Palos Verdes, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 870,976

Int. Cl.[2] B60B *3/12*

U.S. Cl. 301—8 **33 Claims**



15. A wheel made up of a tire rim joined to a wheel center, the improvement comprising strengthening means for the wheel center, said wheel center comprising an apex region positioned radially intermediate the radial innermost and the radial outermost portions of said wheel center, said wheel center having portions sloping axially rearwardly and radially outwardly from said apex region to said radially outermost portions and portions sloping axially rearwardly and radially inwardly from said apex region to said radial innermost portions, said wheel center further comprising protrusions formed of the material of and extending axially of said apex region, and said strengthening means being joined to said wheel center at said apex region to compensate for any loss of strength in said wheel center caused by said protrusions.

4,181,365

WHEELS FOR MOTORCYCLES

Takeshi Kawaguchi, Fujimi; Yasuhisa Kobayashi, Saitama, and Masayuki Onimaru, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,053

Claims priority, application Japan, Apr. 8, 1976, 51-43487[U]; May 1, 1976, 51-55235[U]; Jun. 25, 1976, 51-83689[U]; Jul. 7, 1976, 51-80602

Int. Cl.[2] B60B *1/10, 1/14*

U.S. Cl. 301—67 **15 Claims**

1. A wheel for a vehicle, comprising:

a wheel hub;

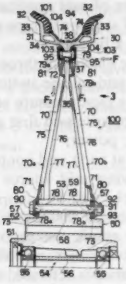
a wheel rim having at least one projection on its inner surface;

a plurality of pairs of plates which are mechanically and operably connected to said wheel hub and said rim projection;

said wheel hub, said rim projection and each of said pairs of plates forming in a vertical cross-section a triangle having said rim projection at the apex of said triangle, the base of said triangle being formed by a portion of said wheel hub;

each plate of said pairs of plates having fitting parts provided

at spaced-apart edge portions on the end of said plate connected to said wheel hub; and



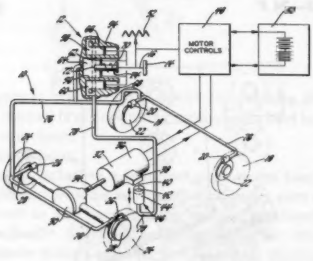
said fitting parts being overlapped on the fitting parts of adjacent plates on both sides of each said plate, and firmly connected thereto.

4,181,366

INTEGRATION OF REGENERATIVE BRAKING AND CONVENTIONAL BRAKING

Donald J. Dobner, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1978, Ser. No. 927,853
Int. Cl.² B60T *13/74*
U.S. Cl. 303—3 **2 Claims**



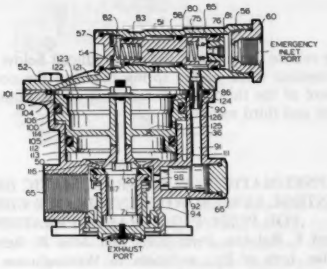
1. A vehicle brake system comprising:
rotatable vehicle wheels to be braked;
a brake force generator adapted to be controlled by a total braking effort demand signal generated by the actuation of a vehicle operator in accordance with desired total vehicle braking effort on the wheels;
wheel braking means for said vehicle wheels actuatable by said brake force generator to generate vehicle braking effort;
regenerative braking means responsive to rotation of said wheels when said brake force generator is actuated to exert a regenerative braking effort on said wheels as a function of the speed of rotation of said wheels;
signal generating means responsive to the amount of regenerative braking effort exerted on said wheels by said regenerative braking means to generate a regenerative braking signal reflecting the braking effort on said wheels caused by said regenerative braking means, and regenerative braking signal delivery means delivering said regenerative braking signal to said brake force generator;
said brake force generator having means receiving and responsive to said regenerative braking signal and the total braking effort demand signal to maintain the amount of braking effort, generated by said brake force generator and delivered as vehicle braking effort to said wheels through said wheel braking means, at the difference between the desired total braking effort on said wheels and the regenerative braking effort on said wheels, said last named means generating and returning a total braking effort reaction signal to the vehicle operator reflecting the total braking effort on said wheels.

4,181,367

RATIO RELAY EMERGENCY VALVE SYSTEM FOR VEHICLES

Clarence R. Herring, La Habra; Taylor F. Mattern, W. Covina, and Curtis E. Radcliffe, La Habra, all of Calif., assignors to Sealco Air Controls, Inc., City of Industry, Calif.

Filed Jun. 2, 1978, Ser. No. 911,836
Int. Cl.² B60T *15/02*
U.S. Cl. 303—7 **27 Claims**



1. In a brake system for a vehicle system having two sets of brakes, a front set and a rear set of brakes and including a source of fluid pressure, a driver controller valve, said sets of brakes responsive to fluid pressure from said source via said driver controlled valve, said brake system including a secondary valve having at an input port, a connection to said driver controlled valve and its output port coupled to said rear brakes, and in which said secondary valve means produces a substantially instantaneous increase in pressure at the output port above the pressure of said input port, the improvement comprises:
said secondary valve including time delay means for bleeding excess pressure at said outlet port to reduce the pressure at said output port to substantially the pressure at said inlet port after the application of pressure to said inlet port by operation of said driver controlled valve.

4,181,368

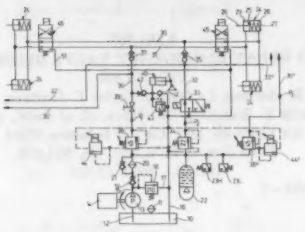
HYDRAULIC VEHICLE BRAKE SYSTEM

Hans-Göran Ström, Lund, Sweden, assignor to SAB Industri AB, Landskrona, Sweden

Filed Mar. 20, 1978, Ser. No. 888,415
Claims priority, application Sweden, Mar. 21, 1977, 7703171
Int. Cl.² B06T *13/70*
U.S. Cl. 303—15 **4 Claims**

1. In a fluid operated vehicle brake system comprising at least one piston-cylinder array with a spring biasing the piston in a brake application direction operatively connected by a fluid circuit array to a brake rigging, first means for controlling the supply of pressurized fluid from a source to operate said array for braking characterized in that the cylinder has fluid chambers for receiving fluid from said source on opposite sides of the piston for applying the piston in either brake application or brake release directions, second means for suppling pressurized fluid from said supply selectively at any pressure between zero and a predetermined maximum pressure in the brake release direction, and third means for suppling pressurized fluid from said supply selectively at a constant pressure lower than said maximum pressure in the brake application direction so that in an emergency braking situation the supplied constant

fluid pressure of the third means in the braking direction is immediately effective as the fluid pressure of the second means is rapidly decreasing toward zero and in the normal braking situation the fluid pressure of the second means applied in the



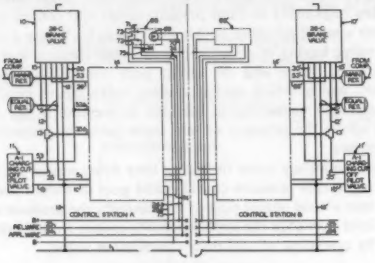
brake release direction is variably reduced below the sum of the constant force of the spring bias and the constant fluid pressure of the third means, said first means comprising said second and third means.

4,181,369

PNEUMATIC/ELECTRO-PNEUMATIC BRAKE CONTROL SYSTEM WITH INTERLOCK CIRCUITRY FOR PUSH/PULL TRAIN OPERATION

Richard F. Balukin, Penn Hills, and John R. Reiss, N. Versailles, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 26, 1978, Ser. No. 973,349
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—16 **8 Claims**



1. In a train arranged for dual station control, a combined pneumatic and electro/pneumatic brake control system comprising:

(a) a brake pipe extending through said train, the variation of pressure in said brake pipe controlling the brakes on said train;

(b) an equalizing reservoir at each control station;

(c) a brake valve device at each control station comprising:

(i) an operating handle movable from a brake release position to a brake application zone, in which said equalizing reservoir at the same control station as said brake valve is charged with fluid pressure according to the position of said handle in said brake application zone;

(ii) relay valve means subject to the fluid pressure effective at said equalizing reservoir at the same control station as said brake valve for controlling the fluid pressure in said brake pipe; and

(d) a master controller device at each control station subject opposingly to the pressures in said brake pipe and said equalizing reservoir at the same control station as said master controller, and having application and release switches each open in the absence of a pressure differential between said brake pipe and equalizing reservoirs, one or the other of said switches being closed when a pressure differential arises between said brake pipe and equalizing reservoir depending upon the sense of said pressure differential;

(e) a brake application wire extending through said train and energized by closure of said application switch to provide electrical control of said brake pipe pressure so as to effect variation thereof in a first sense;

(f) a brake release wire extending through said train and energized by closure of said release switch to provide electrical control of said brake pipe pressure so as to effect variation thereof in a sense opposite said first sense;

(g) a source of electric power;

(h) interlock circuitry at each said control station, one of said control stations having said source of power connected thereto, said interlock circuitry comprising:

(i) pressure switch means for connecting power from said interlock circuitry at said one control station to said master controller switches thereat when said brake valve at said one control station is activated and for energizing said brake application wire in bypass of said master controller application switch only when said brake valve at said one control station is deactivated; and

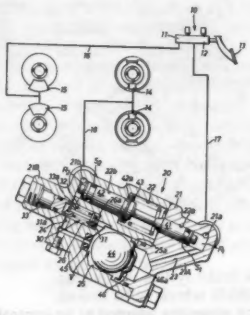
(ii) means for deenergizing said brake application wire responsive to energization of said brake release wire.

4,181,370

FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Noeami, Toyota, and Hideyuki Hayashi, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 22, 1978, Ser. No. 879,857
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 F **6 Claims**



1. A fluid pressure control device for incorporation in a vehicle braking system between a master cylinder and a wheel brake cylinder, the device including

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said wheel brake cylinder, and a valve chamber communicating at one end thereof with said inlet port and at the other end thereof with said outlet port;

a valve seat provided in said valve chamber to permit the flow of fluid between said inlet and outlet ports therethrough; and

an inertia-controlled valve element located within said valve chamber to co-operate with said valve seat to cut off the flow of fluid from said inlet port to said outlet port when said valve element is subjected to a deceleration in excess of a predetermined value;

a bypass air bleed passage to permit direct fluid flow from the top of said valve chamber into said outlet port;

bypass valve means disposed within said bypass passage to normally interrupt the direct flow of fluid from said valve chamber to said outlet port; and

manually operable means for opening said bypass valve means to permit bleeding air from the upper part of said valve chamber when brake fluid is being charged into the braking system, wherein the improvement comprises:

said bypass valve means incorporates a check valve means, said check valve means being biased to open for allowing direct flow of fluid from said valve chamber to said outlet port only when a predetermined pressure difference is produced between said valve chamber and said outlet port after said inertia-controlled valve element co-operates with said valve seat.

4,181,371

POWER BRAKE CONTROL VALVE FOR VEHICLES

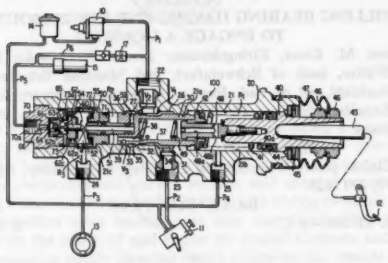
Yoshiharu Adachi, Gamagoori, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 18, 1978, Ser. No. 870,438

Claims priority, application Japan, Jan. 18, 1977, 52/4194

Int. Cl.[2] B60T *13/16, 13/14*

U.S. Cl. 303—50 **8 Claims**



1. A power brake control device for vehicles disposed between a manual brake operating means and wheel brake means, which comprises:

an accumulator;

a housing including a first inlet port means connected to a hydraulic pressure source, a second inlet port means connected to said accumulator, said accumulator being hydraulically disposed and interconnected between said pressure source and said first inlet port means;

a first outlet port means hydraulically connected to said wheel brake means and a second outlet port means connected to reservoir means;

spool valve means slidably disposed within said housing and movable by operation of said manual brake operating means for controlling hydraulic communication between said first inlet and second outlet port means;

piston means slidably disposed within said housing for connecting said first outlet port means with said first inlet port means, one end of said piston means being secured to said spool valve means for unitary movement therewith;

an emergency valve means disposed within said housing between said second inlet port means and first outlet port means and also disposed adjacent an end of said piston means opposite said one end, said piston means being movable between a first position in which the fluid from said first inlet port means under pressure controlled by said spool valve means is in hydraulic communication with said first outlet port means and a second position in which said end opposite said one end of said piston means is engaged with said emergency valve means, wherein said emergency valve means is actuated to first interrupt hydraulic communication between said first inlet port means and said first outlet port means and to thereafter establish hydraulic communication between said second inlet port means and said first outlet port means.

4,181,372

MODULATOR FOR ANTI-SKID VEHICLE BRAKING SYSTEMS

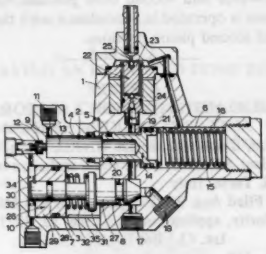
Ivan Mortimer, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 30, 1977, Ser. No. 856,204

Claims priority, application United Kingdom, Feb. 26, 1977, 08260/77

Int. Cl.[2] B60T *13/68;* F16K *31/06*

U.S. Cl. 303—115 **1 Claim**



1. A pressure modulator for a vehicle anti-skid braking system comprising a housing having first and second cylinder bores and a variable volume chamber, said chamber having a first inlet for connection to a fluid pressure source and a first outlet for connection to a slave cylinder of a wheel brake, a piston assembly working in said first cylinder bore in communication with said chamber and including means controlling communication between said first inlet and said first outlet and controlling the effective volume of said chamber said means being movable between a first advanced position in which said effective volume is at a minimum value and said first outlet is in communication with said first inlet, and a second retracted position in which said effective volume is increased to reduce the pressure applied to said slave cylinder and said first inlet is cut-off from said first outlet, a modulator piston of stepped outline working in said second cylinder bore and having a first end of smaller area which acts on said piston assembly, a second end of greater area, and a shoulder at a step in diameter between said ends, said housing having a second inlet for connection to said fluid pressure source, means connecting said second inlet to said shoulder at all times, spring means acting on said modulator piston with a force biassing said modulator piston and said piston assembly towards said first advanced position, anti-skid means controlling communication between said shoulder and said second end so that said shoulder is normally in communication with said second end and said spring force is augmented by the pressure at said second inlet acting over a difference in area between said shoulder and said second end to maintain said piston assembly in said advance position, said anti-skid means being operative to isolate said shoulder from said second end and exhaust said pressure acting on said second end when a skid detection signal exceeds a predetermined value, whereby pressure at said second inlet acting on said shoulder overcomes said spring force to urge said modulator piston into said second retracted position, wherein said housing has a second outlet for connection to a power operable mechanism operable by said pressure source, and a third cylinder bore of stepped diameter having a first bore portion of greater diameter and a second bore portion of smaller diameter, and a control piston assembly of differential outline works in said third bore, said control piston assembly comprising an outer piston part and an inner piston part which are relatively movable, said outer piston part working in said first bore portion, and said inner piston part having a first piston portion of greater area which works in said second bore portion and a second piston portion of smaller area which works through a longitudinally extending bore in said outer

piston part, said outer piston part and said second piston portion being exposed to pressure at said first inlet, and said first piston portion being exposed to pressure at said second inlet, a face between said second inlet and said second outlet with respect to which said first piston portion is movable to define throttle means for regulating flow between said second inlet and said second outlet, a pre-load spring means acting between said inner and outer piston parts to permit both said inner and outer piston parts to move in unison, and stop means in said housing for arresting movement of said outer piston part in a direction towards said second bore portion, whereafter said throttle means is operated in accordance with the area ratio of said first and second piston portions.

4,181,373

HYDRAULIC ACTUATOR FOR A MOTOR VEHICLE ANTI-SKID BRAKING SYSTEM

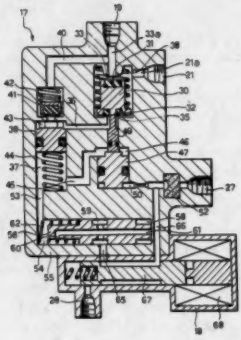
Paolo Vannini, Cambiano; Enrico Rivetti, Turin, and Antonino Bertone, Sant Antonino, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Aug. 30, 1978, Ser. No. 938,148

Claims priority, application Italy, Sep. 12, 1977, 69013 A/77

Int. Cl.[2] **B60T** *8/04, 13/68*

U.S. Cl. 303—116 **5 Claims**



1. In a motor vehicle hydraulic anti-skid braking system comprising:

a master cylinder,

a reservior for brake fluid,

a volumetric pump,

a pressure modulating valve,

sensors sesitive to the dynamic state of the wheels and operable to produce an output signal when an incipient skid state is detected,

an electronic circuit for processing said signals,

brake cylinders of the wheels and

a hydraulic actuator controlled by said electronic circuit to vary the pressure in said braking circuit upon the generation of signals from said sensors,

the improvement wherein said actuator comprises a three-way two-position hydraulic valve which is normally open at one end to connect a delivery conduit for brake fluid from said master cylinder to said brake cylinders,

double-acting piston slidably sealed in a chamber in said actuator, which chamber it separates into two parts, one part of which is connected to a conduit for delivery of brake fluid from said pressure modulating valve;

an expansion chamber separated into two parts by a piston slidably sealed therein, one part of said expansion chamber being connected to the other part of said chamber housing said double-acting piston, and the other part of said expansion chamber being connected by an internal passage to the other end of said three-way two-position hydraulic valve and to a unidirectional valve which is connected to said master cylinder and which is normally closed;

a dynamic hydraulic unit comprising a cylindrical bore in said actuator body housing a piston slidably sealed therein, which piston separates the bore into first and second chambers, said first chamber being connected to the said one part of said expansion chamber and also, by means of a radial throttle passage to an axial passage, formed within the piston, which communicates with said second chamber and with a third chamber in the bore which is defined centrally by an annular groove in the piston; and

a three-way two-position solenoid valve for controlling said hydraulic actuator, said solenoid valve normally connecting said conduit for delivery of fluid from said modulating control valve with said third chamber of said hydraulic unit and, in the energised position, commuting to connect said third chamber to a discharge conduit for said brake fluid.

4,181,374

ROLLING BEARING HAVING END RINGS MOUNTED TO ENGAGE A HOUSING

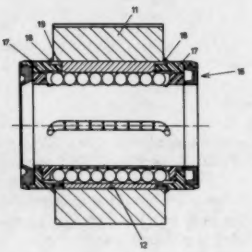
Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,754

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717425

Int. Cl.[2] **F16C** *29/06*

U.S. Cl. 308—6 C **8 Claims**



1. In a rolling bearing including an outer sleeve adapted to be fit in a bore of a housing, wherein the housing has side faces at the opposite ends of the bore, the bearing having races extending axially of the bore, a cage having a plurality of rolling element guides distributed about its circumference and consisting of guideways extending axially and semicircular reversing tracks connecting said guideways in pairs, and endless rows of rolling elements arranged in said guides, wherein the bore of the outer sleeve has axially extending races and return tracks for the rolling elements, and has a width corresponding to approximately the length of the axially extending guideway sections in the cage, the cage projecting axially beyond the ends of the outer sleeve and beyond the side faces of said housing, said cage having said semicircular reversing tracks in the portion thereof beyond the outer sleeve, and end rings are mounted over the projecting portions of the cage for outwardly covering the reversing tracks; the improvement wherein the peripheral surfaces of the end rings are provided with surfaces that extend radially outwardly of the outer circumferential surface of said outer sleeve and are positioned to rest against said side faces of the housing for fixing the rolling bearing in said housing bore.

4,181,375

ROLLER BEARING WITH ROLLING ELEMENTS HAVING CONCAVE CENTER PARTS AND CONVEX END PARTS

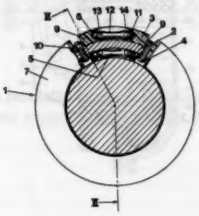
Horst M. Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,447

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 7714897[U]

Int. Cl.[2] F16C *29/06*

U.S. Cl. 308—6 C **10 Claims**



1. In a rolling bearing for linear movement along a curved surface, including an annular member, a plurality of rolling elements having concave rolling surfaces with curvatures for linearly contacting said curved surface, said annular member having a sleeve and a means for guiding said rolling elements to roll in endless rows including at least one axially directed course on the inside of said sleeve for loaded elements and a corresponding axially directed return course on the outside of said sleeve for unloaded elements; the improvement wherein said rolling elements have convexly curved rolling surfaces immediately joined to said concave rolling surfaces, said convex surfaces matching the inside diameter of said sleeve, said means for guiding comprising axially extending guide rails on the inner and outer surfaces of said sleeve, and further comprising a spacer ball engaging said guide rails and the convexly curved rolling surfaces of each adjacent pair of rolling elements, between each convex end of adjacent rolling elements, for spacing said rolling elements with respect to one another in the axially extending raceways defined between said guide rails.

4,181,376

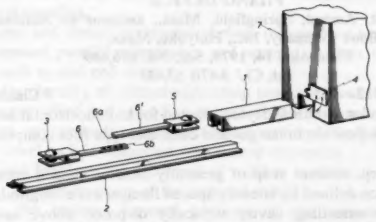
ROLLING TYPE DOOR OR WINDOW GUIDE

Lin Tah-Sun, 3rd Flr., 146, Chang-Chun Rd., Taipei, Taiwan

Filed Jun. 28, 1978, Ser. No. 919,783

Int. Cl.[2] F16C *29/04*

U.S. Cl. 308—6 R **5 Claims**



1. A rolling type guide for use between a pair of mutually slidable elements comprising a first elongated track member for attachment to one of said elements, a second elongated track member for attachment to the other of said elements, a rolling assembly receivable between said track members, said assembly comprising a pair of rods, each rod carrying a rolling contact element at one end of the respective rod and means for releasably connecting said rods together at a plurality of different locations lengthwise of the rods to adjust the length of the assembly, said rolling contact elements engaging opposed surfaces of the respective track members when received therebetween, means associated with said track members for laterally confining said rolling assembly and end constraints for longitudinally confining said rolling assembly within one of said track members.

4,181,377

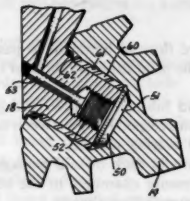
ROCK BIT HAVING AN IMPROVED CONE RETENTION SYSTEM

Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 26, 1978, Ser. No. 919,330

Int. Cl.[2] F16C *33/66*

U.S. Cl. 308—8.2 **8 Claims**



1. A rotary rock bit comprising a main bit body having a plurality of legs extending downwardly therefrom, each leg having a journal with a bearing surface formed thereon, a cone cutter having an interior cavity rotatively supported on the bearing surface of each journal, and means for retaining each cone cutter on each respective journal, each retaining means comprising:

an annular thrust member adapted to extend into a groove formed in the interior cavity of the respective cone cutter, said thrust member comprising a plurality of arcuate segments extending substantially the entire bearing surface between the cone cutter and the journal to enable the segments to function as friction bearings for the legcutter assembly; and

means for urging each thrust member against a shoulder formed on said registering journal, said urging means comprising a retaining member having a flanged portion extending radially outwardly to engage said thrust member, said retaining member further having a securing portion which is adapted to be secured to said journal, said securing portion having a diameter sufficient to effectively resist the thrust loads generated from the cone cutter.

4,181,378

DOCTOR BEARING INTEGRAL PRESSURE LUBRICATION

John F. Schmaeng, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 14, 1978, Ser. No. 915,369

Int. Cl.[2] F16C *33/74*

U.S. Cl. 308—36.1 **10 Claims**

1. A force fed lubricated bearing structure such as for a doctor bearing in a paper making machine comprising in combination:

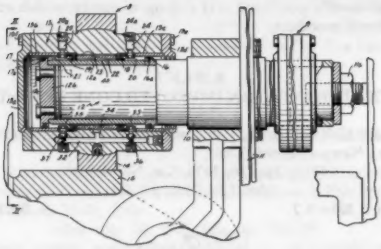
a doctor shaft having a journal axially oscillatable;

an annular bearing housing surrounding the journal and having a bearing surface element in supporting sliding engagement with the journal with first and second annular

spaces between the journal and bearing housing at the ends of the bearing surface;

first and second annular outer end seals at the axial outer ends of said annular spaces and being mounted for axial movement with the journal;

first and second annular inner lip seals spaced axially inwardly of said end seals and forming lubrication pressure chambers between the lip seas and end seals permitting the



axial outward flow of lubricant to pass the lip seals and preventing the axial flow of lubricant in an inward direction;

first and second lubrication flow passages in the housing communicating respectively between said pressure chambers and said bearing surface;

and check valves in each of said passages permitting flow from said pressure chambers to the bearing surface and preventing reverse flow therein.

4,181,379

BEARING STRUCTURE LUBRICANT FEED SYSTEM

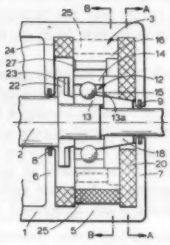
Robert ... Letts, Fleet, England, assignor to Airscrew Howden Limited, England

Filed Dec. 9, 1977, Ser. No. 859,151

Claims priority, application United Kingdom, Oct. 4, 1977, 41290/77

Int. Cl.[2] F16C *33/66*

U.S. Cl. 308—187 **14 Claims**



1. A bearing structure wherein a shaft is supported for rotation with reference to a relatively fixed member on a row of orbitally moving rotating elements and a lubrication system is provided for said elements, the structure including:

a generally conical shaft portion extending with increasing diameter from one side thereof to the row of rotating elements;

a stationary lubricant reservoir made of absorbent material and in contact with the conical shaft portion over an arc less than 360°;

a flange on the shaft portion at said other side;

a stationary collector ring radially spaced from the flange to receive lubricant flung centrifugally thereby; and

return means extending between the collector ring and the reservoir.

4,181,380

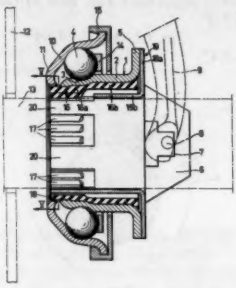
SELF ALIGNING CLUTCH RELEASE BEARING

René Vinel, Bourg la Reine; Jean-Pierre Querton, Maison Alfort, and Claude Serville, Clamart, all of France, assignors to SKF Compagnie d'Applications Mechaniques, Clamart, France

Filed Mar. 21, 1978, Ser. No. 888,720

Int. Cl.[2] F16C *19/10*

U.S. Cl. 308—233 **7 Claims**



1. A self-aligning clutch release bearing mountable on a guide tube in a clutch assembly, comprising,

an outer bearing-race ring,

an inner bearing-race ring concentric with the outer bearing-race ring and slidable axially with respect to the guide tube, said inner bearing-race ring having a radial flange,

an elastic collar on the interior of the inner bearing-race ring, said elastic collar having a portion comprising a plurality of resilient internal projections which lie in direct contact with the guide tube, and a portion free from internal projections,

a rigid guide socket having at least a portion thereof lying radially inwardly of the inner bearing-race ring and in direct contact with the guide tube, said guide socket having a radial flange in frictional contact with the radial flange of the inner bearing-race ring to deter inclination of the inner bearing-race ring relative to the guide tube,

said guide socket being freely slidable relative to the guide tube and having a length substantially the same as the total length of the elastic collar, said guide socket including axial extensions which extend between said internal projections of the elastic collar, said guide socket having openings between said extensions to allow said internal projections of said elastic collar to contact the guide tube.

4,181,381

FILING DEVICE

Robert St. Amand, Springfield, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed Apr. 14, 1978, Ser. No. 896,489

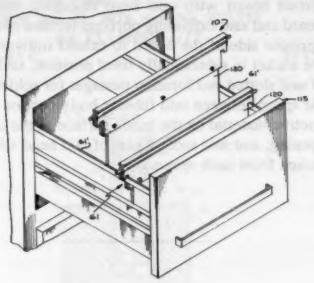
Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—183 **7 Claims**

1. A binder and filing device adapted for both horizontal and vertical disposition in hanger and carrousel type files comprising

a unitary, resilient strip of generally channel shaped cross section defined by laterally spaced flanges and a longitudinally extending cavity vertically disposed above said channel, said strip including downwardly opening notches formed in the outer end portions of said laterally spaced flanges extending outwardly of the ends thereof and being adapted for engagement with support rails of a file drawer,

a rod removably disposed in said cavity and extending longitudinally outwardly from the ends thereof, said rod being



adapted to pivotally secure said strip in a vertical orientation between supports in an upright file rack.

4,181,382

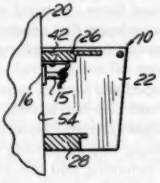
TOWEL-RACK-SUPPORTED SHELF CABINET

Louis A. Harvey, 15107 Ilene, Detroit, Mich. 48238

Filed Mar. 27, 1978, Ser. No. 890,271

Int. Cl.² A47B *97/00*

U.S. Cl. 312—245 **2 Claims**



1. A shelf cabinet adapted to be suspendedly supported by a conventional towel rack attached to the wall of a room, said cabinet comprising

a pair of cabinet end plates disposed in horizontally-spaced relationship,

upper and lower horizontal shelves disposed in vertically-spaced parallel relationship and secured at their opposite ends to said end plates,

and a plurality of cabinet-supporting brackets secured to said upper shelf and extending rearwardly thereon and adapted to supportingly engage the conventional wall-attached towel rack in supported relationship therewith,

said brackets being formed of resilient material in the approximate shape of the numeral seven,

the inclined forward portions of the numeral-seven-shaped brackets being of undulating form with alternating projections and towel-rack-rod fitting recesses therealong,

the upper portions of the numeral-seven-shaped brackets being secured to the under side of said upper shelf.

4,181,383

DIFFERENTIAL ROLL PULL-OUT SYSTEM

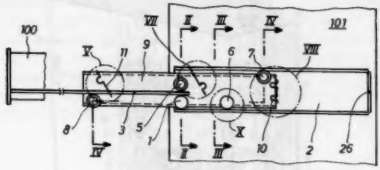
Emil Naef, Goldach, Switzerland, assignor to Walter Baumann, Herisau, Switzerland

Filed Mar. 9, 1978, Ser. No. 885,041

Claims priority, application Switzerland, Mar. 11, 1977, 3105/77

Int. Cl.² A47B *88/00*

U.S. Cl. 312—334 **6 Claims**



1. A differential roll pull-out system for a drawer or the like, comprising:

stationarily mounted guide rails;

pull-out rails guided at said stationarily mounted guide rails;

traveling rails guided at said pull-out rails;

said traveling rails coacting in pairs with the drawer;

roller bodies for mutually guiding said rails at one another;

each pull-out rail being constructed as a hollow profile member having at least one hollow compartment for receiving said roller bodies;

each pull-out rail being provided with a number of oppositely situated collars at which there are fixedly mounted without the use of bolts and screws the roller bodies cooperating with said pull-out rail;

each said pull-out rail including at least two different cooperating profile members;

said coacting profile members include cooperating tab means and slot means latchingly interfitting with one another in order to releasably interconnect said two profile members with one another.

4,181,384

FLAT CABLE CONNECTOR HAVING WIRE DEPLOYMENT MEANS

Frank P. Dola, Port Richey, and Frederick W. Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 6, 1978, Ser. No. 875,642

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 R **18 Claims**

1. An electrical connector for use in interconnecting a first multi-conductor electrical cable generally having a ground-signal-ground configuration and the ground conductors in a second multi-conductor electrical cable to two rows of upstanding electrical posts, each row comprising a plurality of signal posts flanked on at least one end by a ground post, all ground conductors and ground posts being commoned; said connector comprising:

a first housing member having template means on an inner surface for receiving a portion of said conductors in said first cable,

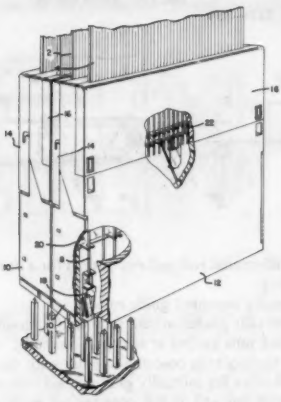
a second opposed housing member pivoted relative to said first housing member also having template means on the inner surface thereof for receiving the remaining portion of said conductors in said first cable,

a third housing member having signal terminals in row configuration and a first grounding bus, both on two opposite surfaces thereof,

upstanding conductor termination means on said terminals and on said first grounding bus for establishing electrical contact with conductors in said template means as said

first and second housing members are mated with said third housing member,

a second ground bus located adjacent to an exterior surface of said first housing member, said second grounding bus having a plurality of conductor termination means for establishing electrical contact with the ground conductors of said second multi-conductor cable, and



a reversely oriented conductor termination means extending from said exterior surface to said inner surface to establish electrical contact with one of said ground wires in said first cable, whereby

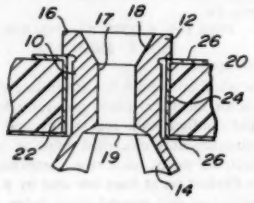
electrical contact can be established between corresponding terminals and conductors to form a connector which can be mounted on said plurality of posts.

4,181,385

LOW PROFILE SOCKET FOR CIRCUIT BOARD WITH GAS VENTS FOR FIXED POSITION SOLDERING

John A. DeSantis, North Lauderdale, and Ellis J. Gottlieb, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1978, Ser. No. 891,970
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 C **10 Claims**



1. A socket for use on a circuit board for releasably receiving a component lead, which socket has an opening of a predetermined diameter and wherein conductive material is included on the inside surface of the opening,

such socket including an elongated conductive tubular body portion having an outside diameter smaller than the predetermined diameter of the opening,

an integral head on one end of said tubular body portion having a first part extending outward beyond said outside diameter to an extent greater than the difference between said outside diameter and the predetermined diameter, said head having a second part which is within the limit of said outside diameter of said tubular body portion,

said tubular portion having slots therein at the end thereof opposite to said head forming extending portions with open spaces therebetween,

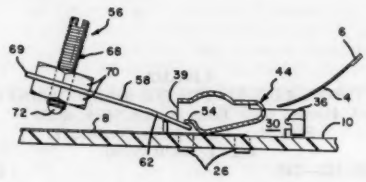
said socket being adapted to be inserted in the opening in the circuit board with said head engaging one side of the board and said extending portions formed over against the opposite side of the board to extend outwardly and hold the socket in substantially fixed position, said open spaces of said slotted end forming passages for solder to flow into the space between said tubular body portion and the conductive material on the inside surface of the current board opening, and said second part of said head allowing gas to escape from such space.

4,181,386

ZERO INSERTION FORCE CONNECTOR CLIP

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 918,139, Jun. 22, 1978. This application Oct. 23, 1978, Ser. No. 953,677
Int. Cl.[2] H05K *1/12, 3/36*
U.S. Cl. 359—17 F **6 Claims**



1. A zero insertion force electrical connector clip for connecting parallel spacedapart film conductors on a film to parallel spaced-apart circuit board conductors on a circuit board, said clip comprising:

a one-piece stamped and formed member having a rectangular clip bar, said clip bar having ends, having first and second side edges extending between said ends and having integral mounting and supporting means extending from said ends for mounting said clip on a circuit board with said clip bar spaced from, and parallel to said circuit board and extending transversely of said circuit board conductors, said mounting and supporting means comprising flanges extending from said ends of said clip bar, the distance between the opposed surfaces of said flanges being equal to the width of said film,

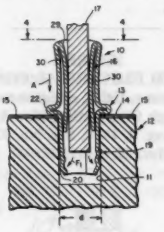
a plurality of spaced-apart cantilever springs extending from said first side edge, the number of said springs being equal to the number of said film conductors, said cantilever springs being reversely bent adjacent to said first side edge and having spring arm portions between said flanges, said cantilever springs each having a free end portion which is remote from said first side edge, said free end portions extending substantially parallel to said clip bar whereby,

upon mounting said clip on said circuit board in straddling relationship to said circuit board conductors on said circuit board and with said spring arm portions of said cantilever springs resiliently biased against said circuit board conductors, said cantilever springs can be raised from said circuit board by said free end portions thereby to permit insertion of said film between said cantilever springs and said circuit board with zero insertion force.

4,181,387
INTERCONNECT SOCKETS AND ASSEMBLIES

Jay A. Walters, Shreveport, La., assignor to Western Electric Company, Inc., New York

Filed Jun. 21, 1978, Ser. No. 917,773
Int. Cl.[2] H05K 1/12
U.S. Cl. 339—17 C 37 Claims



1. An interconnect socket having component parts capable of being assembled with a substrate having a mounting hole in a planar surface of the substrate and a conductive pattern having a planar outer surface formed on the same surface of the substrate in the vicinity of the hole, and capable of receiving a lead of an electrical component, for providing electrical interconnection between the lead and the conductive pattern, said interconnect socket being a member formed at least in part of electrically conductive material and comprising:

(a) a mounting section adapted to be inserted into the hole, the mounting section having spring means for resiliently gripping portions of the inner walls of the hole when the mounting section is inserted into the hole, to fasten the socket in the hole by mechanical spring forces;

(b) a midsection including spring contact means having a contact surface adapted to be positioned against the conductive pattern, for making electrical contact therewith when the mounting section of the socket is fastened in the hole, the contact means comprising spring metal portions extending outward from the periphery of the socket member and having generally planar contact surfaces for resiliently engaging the planar outer surface of the conductive pattern and making electrical contact with a substantial surface area portion thereof when the socket is fastened in the hole; and

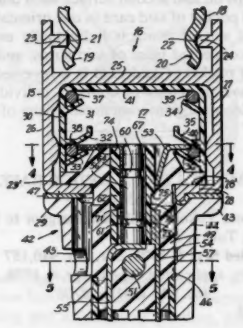
(c) a lead-engaging section into which the component lead is adapted to be inserted, the lead-engaging section having means for gripping and electrically contacting the lead when the lead is inserted into the socket, to connect the lead to the conductive pattern through conductive portions of the socket member.

4,181,388
TAP MEMBER WITH AXIALLY ADJUSTABLE CONTACT FOR MULTI-CONDUCTOR ELECTRICAL TRACK

Anthony C. Donato, Westfield, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.

Filed Aug. 15, 1978, Ser. No. 933,739
Int. Cl.[2] H01R 41/00, 29/00
U.S. Cl. 339—21 R 7 Claims

1. A universal tap member adaptable for drawing power from one of three separate main circuits carried by an electric power distribution track of generally inverted U configuration, said track having a downwardly open channel and including insulation means carrying first and second vertically and horizontally offset pairs of parallel elongate conduits, said tap comprising a base portion adapted to engage against said channel, a bearing member formed on said base portion, a non-conductive spindle rotatably mounted in said bearing member from a first to a second position, a neutral contact member fixedly mounted to said spindle and positioned to engage a selected one of said conduits responsive to rotation of said spindle to said second position, an elongate conductor shaft of regular cross section mounted on said spindle and electrically isolated from said neutral contact, said shaft having its longitudinal axis concident with the axis of rotation of said spindle, a live contact member mounted on said spindle and including a commutator portion slidingly engaging said shaft in electrical contact therewith, said live contact member being shiftable axially of said spindle, complemental stop means interposed

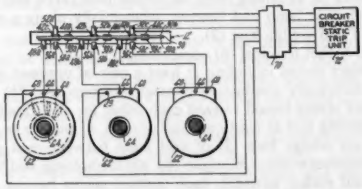


between said live contact member and said spindle for supporting said contact means adjustably in one of three discrete positions relative to said shaft, said contact means including a longitudinally directed contact portion electrically connected to said commutator and positioned to engage a selected conduit other than said one conduit in accordance with the adjusted position of said contact member and spindle responsive to rotation of said spindle from said first to said second position.

4,181,389
TAP CHANGING ELECTRICAL CONNECTOR FOR STATIC TRIP CIRCUIT BREAKERS

George W. Kiesel, Burlington, and Henry G. Willard, Wethersfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,019
Int. Cl.[2] H01R 29/00; H02H 3/28; H05K 1/07
U.S. Cl. 339—32 M 10 Claims



1. A selectable tap changing electrical connector for separately electrically connecting either corresponding first or second secondary winding taps of each of a plurality of phase current transformers to the static trip unit of an industrial circuit breaker, said connector comprising, in combination:

A. a card having opposed first and second insulative surfaces;

B. a receptacle having a pocket accommodating insertion of said card;

C. a first set of contacts situated to one side of said pocket for individual electrical connection to the circuit breaker static trip unit;

D. a second set of contacts situated to the other side of said

pocket and individually electrically connected respectively to corresponding first secondary winding taps of the phase current transformers;

E. a third set of contacts situated to said other side of said pocket and individually electrically connected respectively to corresponding second secondary winding taps of the phase current transformers; and

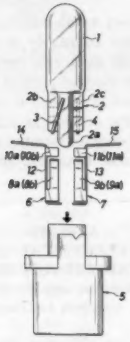
F. plural sets of discrete conductive strips positioned on said first and second insulative card surfaces, certain strips on said first surface individually electrically connected with certain strips on said second surface such that, upon insertion in said pocket of said card in one orientation, said first and second sets of contacts individually engage electrically interconnected pairs of said strips, and, upon insertion in said pocket of said card in a reversed orientation, said first and third sets of contacts individually engage different electrically interconnected pairs of said strips.

4,181,390

SOCKET TERMINALS FOR A WEDGE BASE ELECTRIC LAMP

Masanobu Aizawa, Yokohama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1978, Ser. No. 940,157
Claims priority, application Japan, Apr. 4, 1978, 53/43834[U]
Int. Cl.[2] H01R *33/06*
U.S. Cl. 339—65 **10 Claims**



1. A socket terminal (6) for mounting and making electrical contact to a wedge base electric lamp (11) having at least one lead wire (3, 4) exiting from the wedge base (2) of said wedge base electric lamp and running substantially along a surface (2*b*) of said wedge base (2).

said socket terminal (6) comprising:

contact means including at least a pair of opposed springy electrically conducting contact members (8*a*, 8*b*) which are spring-biased toward each other for electrically contacting said at least one lead wire (3, 4) and for engaging said wedge base (2) of said lamp between said pair of opposed contact members (8*a*, 8*b*) for holding said lamp in said socket terminal, each contact means having a bent retaining portion for engaging a recess on the wedge base of said wedge base lamp to retain said wedge base lamp in said socket terminal;

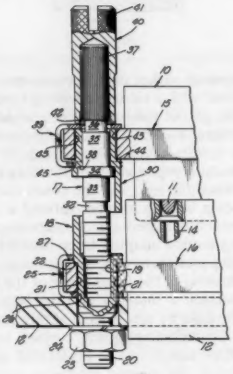
at least a pair of opposed, electrically conducting, generally U-shaped for spring members (10*a*, 10*b*) integral with, located above and spaced from said contact members (8*a*, 8*b*) in the direction of insertion of said wedge base lamp and in alignment with said contact members, said generally U-shaped spring members being arranged with the open part of the U-shape facing each other and being positioned so that upon insertion of said wedge base electric lamp into said socket terminal (6), at least one leg of each of said generally U-shaped spring members engages respective opposite surfaces of said wedge base (2) and at least one leg of at least one of said generally U-shaped spring members springingly engages a lead wire (3, 4) to align said lead wire so that it contacts at least one of said contact members (8*a*, 8*b*) upon further insertion of said wedge base of said lamp into said socket terminal, thereby assuring electrical contact between said at least one lead wire (3, 4) and at least one of said contact members (8*a*, 8*b*) and securing said wedge base electric lamp in said socket terminal.

4,181,391

POLARIZED ELECTRICAL CONNECTOR

Jan A. Kilsdonk, Corona, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,345
Int. Cl.[2] H01R *13/64*
U.S. Cl. 339—92 M **1 Claim**



1. An electrical connector assembly comprising: a plug having a flange with a hole therethrough, said plug flange hole having an axis; a receptacle having a flange with a hole therethrough coaxial with said plug flange hole; a first U-shaped clip straddling said plug flange; a second U-shaped clip straddling said receptacle flange, said flanges having flat portions in an axial direction adjacent respective holes therethrough, said first and second clips having flat portions contiguous to those of said plug and receptacle, respectively; a first keying device having a hollow cylindrical first shank fitted contiguous to and inside said plug flange hole, said first keying device having a hollow tube with a polygonal external surface with a maximum cross section greater than that of the outside diameter of said first shank and abutting said plug flange on the side thereof facing said receptacle flange, said first clip having first and second legs, said first leg having an axial hole aligned with said plug flange hole, said second leg having a slot to conform to said first keying device polygonal surface and to keep said first keying device from rotating; a shaft extending through said first shank and said first clip hole to a point above said first clip; rotation means fixed to said shaft above said plug flange to turn said shaft and to hold said shaft above said flange, said shaft having a flange to abut said first keying device to prevent axial movement thereof, said shaft having a lower threaded end; a second keying device having a hollow internally threaded cylindrical second shank fitted contiguous to and inside said receptacle flange hole; and releasable means to hold said second keying device in a fixed axial position relative to said receptacle flange, said shaft being capable of being threaded into said second shank, said second keying device having a hollow tube with a polygonal surface, said second clip being similar in construction to said first clip and having a second leg with a slot to conform to the polygonal surface of said second keying device, said tubes having 180 degree notches and being

turned 180 degrees relative to each other so that they can move vertically without abutting, threading of said shaft into said second shank causing said plug and receptacle to mate.

4,181,392

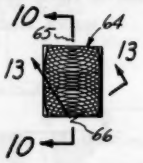
CLAMPING MEANS AND TOOL FOR MAKING IT

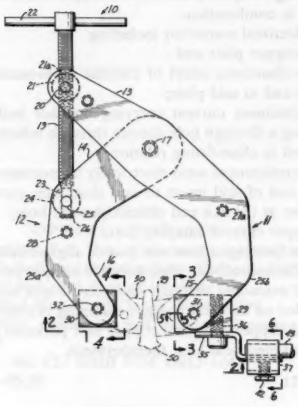
William A. Casler, and Phillip E. Saurenman, both of Pasadena, Calif., assignors to Clamp Mfg. Co., Inc., South El Monte, Calif.

Continuation of Ser. No. 760,696, Jan. 19, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 913,968

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—95 R **16 Claims**





15. A jaw block for gripping the surface of another object, said block comprising:

a face containing a plurality teeth in the form of at least two sets of concentric circularly arcuate teeth, each said set having a plurality of teeth, said sets being centered on respective centers which are spaced apart from one another and located on a straight line which traverses said face of said rotatable jaw block so that teeth of one set intersect teeth of the other set, each tooth which does intersect a tooth of the other set doing so with the same tooth at two places between the said centers, there being at least two such intersecting teeth in each set, the centers of concentricity of the teeth of each adjacent set being located on a respective line which traverses the face of said block whereby symmetrical cusp patterns of intersecting teeth are formed along said line; whereby when the other object has a plane surface which is gripped by said block, said teeth inhibit slippage between said block and other object.

4,181,393

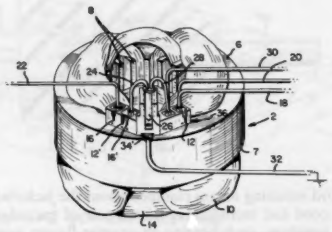
INTERCONNECTING MEANS FOR COIL WINDINGS AND OVERLOAD PROTECTOR

John F. Lill, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 887,585, Mar. 17, 1978, Pat. No. 4,147,398. This application May 26, 1978, Ser. No. 910,047

Int. Cl.[2] H05K *11/00*

U.S. Cl. 339—98 **7 Claims**



1. An insulating housing means which is intended to be mounted on one face of the stator of an induction motor having a main winding and an auxiliary winding, said housing comprising:

an insulating block having a terminal-receiving face, first, second, and third terminal-receiving cavities extending into said terminal-receiving face,

a first wire-admitting slot means in said housing communicating with said first cavity, a second wire-admitting slot means in said housing communicating with said second cavity, and third wire-admitting slot means communicating with said third cavity, said third wire-admitting slot means comprising two side-by-side slot means, said first and second wire-admitting slot means comprising a single slot means dimensioned to receive a single wire, each of said cavities being dimensioned to receive a terminal having first and second wire-receiving slots extending therein from one end thereof,

thermal protector supporting means integral with, and extending from, said housing, said supporting means being dimensioned to receive and support a thermal protector whereby,

upon locating one end of said main winding in said slot means associated with said first cavity and with the axis thereof extending across said first cavity, locating one end of said auxiliary winding in said slot means associated with said second cavity and with the axis thereof extending across said second cavity, and locating the other ends of said main and auxiliary windings in said slot means associated with said third cavity and with the axes of said other ends extending across said third cavity, and upon inserting first and second terminals into said first and second cavities respectively, contact is established with said one end of said main and auxiliary windings and upon inserting a third terminal into said third cavity, contact is established with said other ends of said main and auxiliary windings, and upon placement of said thermal protector in said supporting means, said protector is mounted adjacent to said windings.

4,181,394

CORD ATTACHMENT PLUG

Donald M. Dodge, Long Beach, Calif., assignor to Pacific Electricord Company, Gardena, Calif.

Filed Jun. 17, 1976, Ser. No. 697,143

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—103 R **10 Claims**

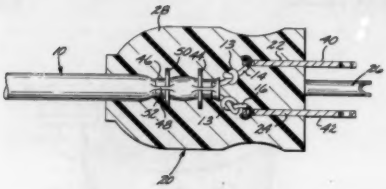
1. An electrical cord and attachment plug assembly comprising:

an electrical cable having an outer jacket and a plurality of

single conductors bearing electrical insulation and extending distally from said jacket;

a plurality of contact members including a pair of flat-bladed prongs carried distally by respective ones of a pair of said single conductors and secured thereto by interlock means;

knot means in each of said pair of single connectors adjacent its distal end;



cord retaining means clamped about the jacketed end of said cord and including at least a pair of spaced-apart slotted bushings, each bearing an annular flange; and

a molded attachment plug body receiving said cord, cord retaining means, single conductors, knot means and contact members and molded thereabout to embed said retaining and knot means in said body and to support said prongs in a spaced-apart, parallel alignment.

4,181,395

CONNECTOR FOR ELECTRICAL COMPONENTS TO BE INSTALLED IN FLUSH RECEPTACLE BOXES

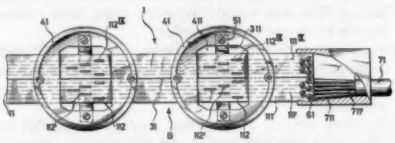
Walter Grabowski, In der Wüste 14, 5960 Olpe-Biggesee, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 880,881

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1977, 2708566

Int. Cl.[2] H02G *3/12*

U.S. Cl. 339—176 MF **1 Claim**



1. A connector for a plurality of electrical devices, particularly switches and receptacles, to be installed adjacently or on top of one another in flush-mounted receptacle boxes, comprising: an insulated flat conductor having wires for at least two independently actuated installation devices; said flat conductor being connectable to a power supply line and to connecting lines; contact blades associated with the wires and placed at predetermined intervals on said wires; a support for flush-mounted receptacle boxes, said flush-mounted receptacle boxes having a cut-out bottom area; said blades forming tapping points backed up by said support; said support projecting beyond said flat conductor; wires being selectively connectable by plug elements assigned to associated contact blades; said contact blades being free of insulation therebetween; said contact blades being fixed and connected to the wires of said flat conductor, said contact blades having an easily detachable insulation, said wires having terminals for connecting to a power supply line and a connecting line, said support being tub-shaped, said wires being embedded in said flat conductor backed by said support, said support extending over the length of said connector, said plug elements being cap-shaped and placed individually on said contact blades, said plug elements being connectable to said devices by cables to be clipped to said device, said tub-shaped support having rim means projecting in the vicinity of said devices beyond said flat conductor with threaded holes for screws to fasten said flush receptable boxes with cutout bottom area for passage of said contact blades, said connector being installed together with attached flush receptacles inside a wall, said devices being connectable individually to associated contact blades by plugging associated plug elements on the contact blades to that they are independently serviceable.

4,181,396

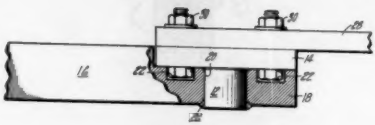
ALUMINUM-COPPER ELECTRICAL JOINT

William F. Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,535

Int. Cl.[2] H01R *7/08*

U.S. Cl. 339—263 R **10 Claims**



1. A high ampacity alumimum-copper electrical joint comprising, in combination:

A. an electrical connector including

(1) a copper plate and

(2) an aluminum insert of circular cross-section welded at one end to said plate;

B. an aluminum current carrying member including means forming a through hole therein through which said insert is inserted in close-fitting relation;

C. a circumferential weld electrically interconnecting the free, other end of said insert to said aluminum current carrying member at the exit end of said through hole;

D. a copper current carrying part;

E. means forming at least one pair of aligned bolt holes exclusively in said copper plate and said copper part, and

F. a bolt extending through said pair of bolt holes and a nut threaded on said bolt to exert clamping pressure exclusively on said copper plate and copper part pursuant to perfecting a bolted electrical joint therebetween.

4,181,397

FIBRE-OPTIC CABLE

Peter D. Baker, Basingstoke, and Douglas V. Luke, Farnham Common, both of England, assignors to Smiths Industries Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,241

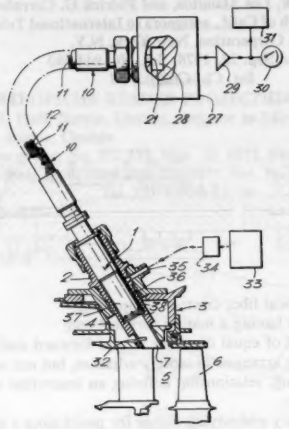
Claims priority, application United Kingdom, Mar. 11, 1977, 10397/77

Int. Cl.[2] G02B *5/16*

U.S. Cl. 350—96.20 **16 Claims**

1. A fibre-optic cable comprising: a first metal ferrule; a fibre-bundle for transmission of radiation, said fibre-bundle extending through said first ferrule to have one end projecting from said first ferrule; a metal collar, said collar extending about said projecting end of said fibre-bundle, and said collar being welded to said first ferrule; and a tube of a glass material, said tube being located within said collar around said project-

ing end of said fibre-bundle, and said tube being melted with the fibres of the fibre-bundle within said collar so that a seal is



thereby provided between the said one end of said fibre-bundle and said first ferrule.

4,181,398

OPTICAL APPARATUS

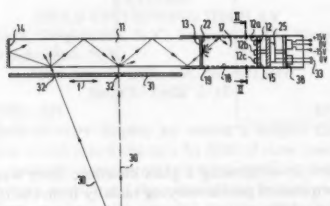
Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,890

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654465

Int. Cl.² G02B 5/14; G01J 1/42

U.S. Cl. 350—96.10 **12 Claims**



1. Optical apparatus comprising an optical passage having an inlet for light at one end for receiving light from a light conducting rod, a reflecting surface for reflecting light internally of the passage and a light receiving device at the other end, there being a screen of individual diverging lenses at said inlet to said optical passage.

4,181,399

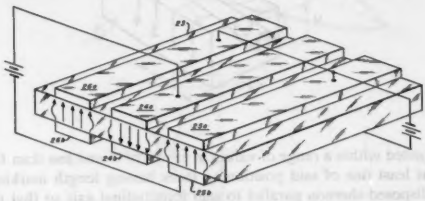
OPTICAL INTERNAL REFLECTANCE SWITCHABLE COUPLER

Donald H. McMahon, Carlisle, Mass., and Arthur R. Nelson, Troutville, Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,888

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.14 **6 Claims**



1. A light guiding apparatus comprising:

a substrate of substantially transparent electrooptic material with index of refraction n_o having first and second major surfaces;

first and second electrode pairs positioned on said first and second major surfaces with one electrode of each pair on said first major surface and the other electrode of each pair on said second major surface, said electrode pairs outlining first and second predefined areas between said first and second major surfaces;

a third electrode pair positioned on said first and second major surfaces with one electrode on each of said major surfaces, said third electrode pair outlining a third predefined area between said first and second major surfaces, said third predefined area being interposed between said first and second predefined areas;

means for applying a first voltage with a predetermined polarity across said substrate through said first and second electrode pairs, the application of said first voltage causing a refractive index n_1 that is less than n_0 in the predefined areas outlined by said first and second electrode pairs as long as said first voltage is applied across said substrate; and

means for applying a second voltage with a polarity opposite said predetermined polarity across said substrate through said third electrode pair, the application of said second voltage causing a refractive index n_2 that is greater than n_O in the predefined area outlined by said third electrode pair as long as said second voltage is applied across said substrate, the application of said first and second voltages creating a main optical guiding channel in the predefined area outlined by said third electrode pair between said predefined areas outlined by said first and second electrode pairs.

4,181,400

CONNECTOR WITH POSITIONING SLEEVES FOR A SINGLE OPTICAL FIBRE

Christian Malsot, and Marcel Roux, both of Suresnes, France, assignors to Socapex, Suresnes, France

Filed Dec. 27, 1977, Ser. No. 864,703

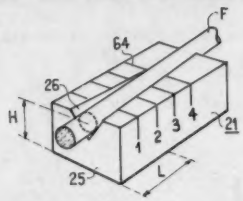
Claims priority, application France, Dec. 31, 1976, 76 39718

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.21 **8 Claims**

1. A positioning sleeve for connecting a single optical fibre having a known diameter, constituted: by a body having a longitudinal axis, a base positioning face, a top face parallel to said base positioning face and two lateral positioning faces, parallel to said axis, two terminal faces, respectively a front one and a rear one, this body containing a passage to receive a single fibre and opening onto said terminal faces, the walls of which are delimited by two planar portions extending to said

top face forming a dihedral angle, wherein that said dihedral angle has its bisector disposed parallel to said axis and perpendicularly to said base positioning face, its apex making in relation to the plane of said base positioning face an angle com-



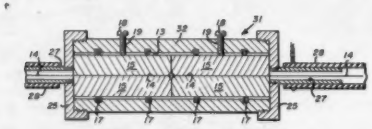
prised within a range of values in excess of 0° and less than 10°, at least one of said positioning faces having length markings disposed thereon parallel to said longitudinal axis so that the height of the longitudinal axis of said fibre along the portion of said fibre received in said passage may be readily determined.

4,181,401

FIBER OPTIC WAVEGUIDE CONNECTOR

Floyd J. Jensen, Watsonville, Calif., assignor to S. C. Cabling, Inc., Freedom, Calif.

Filed Mar. 24, 1978, Ser. No. 889,655
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **9 Claims**



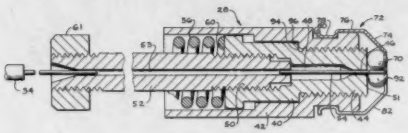
1. In a fiber optic waveguide connector;
housing means for housing at least the end portion of a fiber optic waveguide to be connected in axial alignment with a second optical element for transmission of optical wave energy through said fiber optic waveguide;
sector jaw means for disposition around that portion of the fiber optic waveguide to be disposed within said housing means and which is to be connected to the second optical element, said sector jaw means including a set of movable sector jaw portions for bearing at their inner ends against the outer surface of the fiber optic waveguide and for holding the fiber optic waveguide within said housing;
resilient retaining means for disposition within said housing means and for exerting on said sector jaw means a radially inwardly directed force on each of said movable sector jaw portions and for holding the inner ends of said sector jaw portions in engagement with the outer surface of the fiber optic waveguide; and
adjustment means passing through said housing means for urging respective ones of such sector jaw portions radially of the fiber optic waveguide for adjusting the axial alignment of the fiber optic waveguide as held by said sector portions relative to the second optical element.

4,181,402

SINGLE OPTICAL FIBER CONNECTOR

Leslie M. Borsuk, Los Alamitos, and Patrick G. Corrales, Garden Grove, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,693
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **11 Claims**



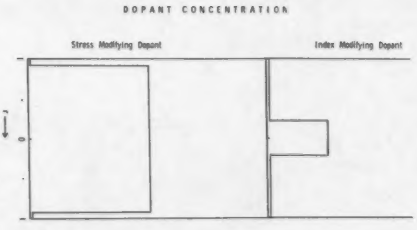
1. A single optical fiber contact comprising:
a support body having a mating forward end;
a set of spheres of equal diameter at said forward end, said spheres being arranged in closely adjacent, but not necessarily engaging, relationship defining an interstitial space therebetween;
said support body embodying means for positioning a single optical fiber so that the end portion thereof lies in said interstitial space, said spheres being dimensioned to each engage said optical fiber in said space;
a plurality of inwardly and forwardly extending resilient fingers fixedly mounted at said forward end of said support body urging said spheres inwardly toward the center of said space; and
the forwardmost surfaces of said spheres extending forwardly of said fingers for nesting with the spheres of a mating contact.

4,181,403

OPTICAL FIBER WITH COMPRESSION SURFACE LAYER

Pedro B. Macedo, Bethesda, Md.; Robert K. Mohr, Washington, D.C., and Prabhat K. Gupta, Mount Rainier, Md., assignors to Pedro Buarque De Macedo, Bethesda and Theodore Aaron Litovits, Silver Spring, both of, Md.

Filed Dec. 30, 1976, Ser. No. 755,588
Int. Cl.[2] G02B *5/14*; C03C *3/04, 25/02*
U.S. Cl. 350—96.33 **6 Claims**



1. An article comprising a glass dielectric fiber waveguide with a composition profile varying radially from the center to the surface which creates a mechanical stress profile and an index of refraction profile, the composition profile forming a core, an intermediate optical clad layer having an index of refraction lower than the core, and a surface layer which is in compression having a thermal expansion coefficient smaller than the core, said surface layer having a predetermined thickness which is less than 10% of the radius of the core, said composition profile including (a) at least one dopant which creates said mechanical stress profile wherein the surface is in compression, the compression being greater than 20,000 psig,

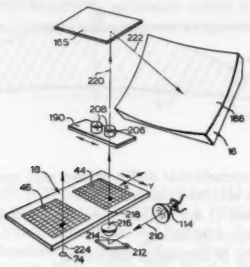
and (b) at least another dopant which creates said index of refraction profile.

4,181,404

MICROFICHE READER PROJECTION SCREEN

Peter J. Hall, Barrie, Canada, assignor to MicroVue Products Inc., Barrie, Canada

Division of Ser. No. 777,772, Mar. 15, 1977, Pat. No. 4,140,376.
This application Sep. 23, 1977, Ser. No. 836,235
Int. Cl.[2] G03B *21/56*
U.S. Cl. 350—125 **1 Claim**



1. In a microfiche viewer having a housing, a screen mounted in said housing and a front projection system for projecting images from a microfiche onto said screen, the projected images being narrow at the upper edge thereof, the improvement wherein said screen comprises;

(a) a unitary body of moulded plastics material having an image receiving surface formed with a concave curvature which has a semi-spherical configuration, said image receiving surface being plated with a layer of image reflecting material, said screen having an upper edge, a lower edge, and a pair of side edges extending from the upper edge to the lower edge, said side edges converging with respect to one another in a direction toward said upper edge whereby the screen has an image receiving surface with is narrower at said upper edge than it is at said lower edge to conform to the configuration of the projected image.

4,181,405

HEAD-UP VIEWING DISPLAY

Edwin Cohen, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

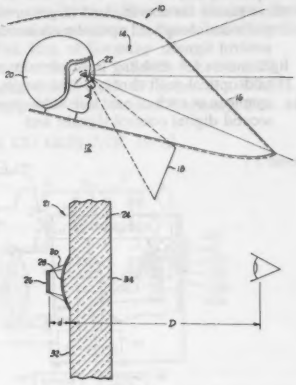
Filed Aug. 7, 1978, Ser. No. 931,299
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—331 **15 Claims**

1. A field of view display by which a subject can view display data which is in focus on a far field of view comprising:

(a) an optically transparent viewing medium interposed between a subject and the subject's far field of view, said medium mechanically coupled to the subject's head in order that movement of the head produces corresponding movement of said medium;

(b) electrically controllable display means attached to said medium in the field view of said subject for transmitting information to the subject, said display means occupying a relatively small angular area of said medium for permitting substantially unobstructed viewing of the far field of view; and

(c) focusing means connected to the medium between the subject and said display means, said focusing means operative to bring the display means into focus to the subject so



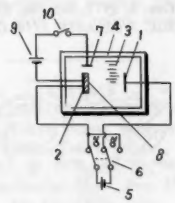
that information transmitted by the display means is superimposed in focus on the subject's field of view.

4,181,406

ELECTROCHROMIC DISPLAY DEVICE

Rikusei Kohara, Ibaraki, and Takashi Aoyama, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 23, 1977, Ser. No. 827,107
Claims priority, application Japan, Sep. 2, 1976, 51-105538; Nov. 17, 1976, 51-138947
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—357 **14 Claims**



1. In an electrochromic display device having a container with at least one transparent part for observing the display and containing a first electrode, a second electrode and an electrochemical electrochromic substance contacting said first electrode and said second electrode, the improvement which comprises

a coating of a product of a redox reaction of the color indicating ions of the electrochemical electrochromic substance formed on said second electrode under conditions when said first electrode does not have a coating of said product.

4,181,407

APPARATUS FOR AUTOMATICALLY TESTING VISION BY PHASE MEASUREMENTS

Gilbert B. Razran, P.O. Box 207, Del Mar, Calif. 92014

Filed Jul. 3, 1978, Ser. No. 921,838
Int. Cl.[2] A61B *3/10*
U.S. Cl. 351—6 **9 Claims**

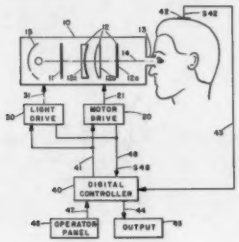
1. An apparatus for automatically testing a patient's vision, said apparatus being comprised of:

optical means including a target, at least one lens, and an

eyepiece serially aligned along one optical path, with said lens or said target having movable positions along said optical path;

drive means for moving said target or said lens to selectable positions along said optical path in response to first digital control signals;

light means for enabling light stimulus to be directed along said optical path through said target, said lens, and said eyepiece at each of said selectable positions in response to second digital control signals; and



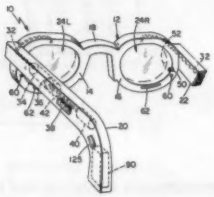
digital control means including output means coupled to said drive means and to said light means for generating said first and second digital control signals in a predetermined sequence, input means for receiving electrical signals evoked in the brain of said patient by said light stimulus, and means for measuring the time delay between said light stimulus and said evoked response at each of said selectable positions.

4,181,408

VISION COMPENSATION

John W. Senders, 1076 Rutherford Rd., R.R. 2, Maple, Ontario, Canada (L0J 1E0)

Filed Dec. 5, 1977, Ser. No. 857,430
Int. Cl.[2] C02C *7/02*; A61B *3/14*; G02C *7/06*
U.S. Cl. 351—159 **16 Claims**



1. A vision compensation system comprising a support frame adapted for wearing by a user, said frame carrying at least one optical member with a variable optical characteristic, means including sensor means carried by said frame for producing an eye position signal as a function of the relative angular positions of the eyes of the wearer and means responsive to said eye position signal for changing the variable optical characteristic of said one optical member to provide compensation for impaired accommodative capacity of the wearer's eye.

4,181,409

ASPHERIC LENS SERIES

Donald B. Whitney, Southbridge; James A. Reilly, Auburn, and John M. Young, Southbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

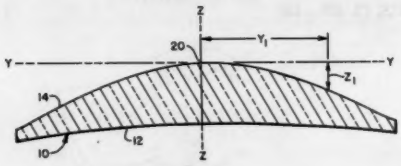
Filed Oct. 16, 1978, Ser. No. 952,188
Int. Cl.[2] G02B *3/04*; G02C *7/02*
U.S. Cl. 351—167 **8 Claims**

1. A series of ophthalmic lenses having vertex powers extending over a range including 10 to 16 diopters wherein each lens of said series has a concave ocular surface and a convex rotationally symmetrical aspheric front surface, said ocular and front surfaces being aligned along an optical axis of said lens and said front surface being defined by the equation

$$Z=AR^2+DR^4+ER^6+FR^8+GR^{10}$$

wherein

Z is the distance parallel to the lens optical axis from the vertex of said front surface to any point on said front surface;



R is the perpendicular distance from said optical axis to said point on said front surface and

A,D,E,F and G are aspheric coefficients selected to afford lens features including:

avoidance of zero-edge thickness;

provision of optimum shallowness of ocular surface curvature for close fitting to user's eye;

maximized optical performance throughout a central field of view of at least 60°; and

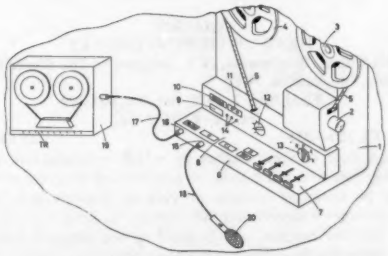
adaptability to direct prescription-finished casting.

4,181,410

METHOD AND APPARATUS FOR AUTOMATIC IMPLEMENTATION OF FADE-IN, FADE-OUT AND FADE-OVER RECORDING EFFECTS ON FILM

Horst Sicha, Nellingen; Dieter Wezel, Stuttgart; Helmut Rube, Grunbach; Wolfgang Riedel, Winnenden; Gerd Mattes, Schorndorf, and Gerhard Börner, Waldenburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,352
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706761; Oct. 26, 1977, 2747889
Int. Cl.[2] G03B *21/36*
U.S. Cl. 352—91 R **28 Claims**



1. A method of automatically producing fade-in, fade-out or fadeover recording effects at predetermined recording transition locations on a film comprised of a series of film frames using a reproduction machine capable of transporting the film both forwards and backwards and reproducing the images on the film frames, counting means capable of counting frames during both forward and reverse film transport, and programmable control means capable of storing frame counts, the

method comprising causing the counting means to feed into the control means information in the form of frame counts identifying the predetermined recording-transition locations on the film; then effecting forwards transport of a predetermined section of the film which includes two of the scene-transition locations and is adjoined by at least one further film section which shares a transition location therewith, causing the control means to count the increments of film during such transport and in dependence thereon and in dependence upon a preestablished program of the control means effecting a recording fade-in at the first transition location of the predetermined film section and a recording fade-out at the second transition location thereof and the termination of film transport upon the completion of the fade-in and fade-out operations, utilizing the stored counts as reference values for the programmed fade-in, fade-out and transport termination.

4,181,411

INDICATOR DEVICE USED IN CAMERA TO INDICATE EXPOSURE VALUES WITHIN A FINDER

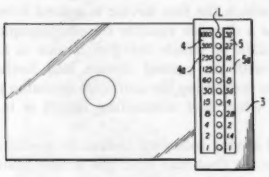
Naoyuki Uno, Urawa; Tetsuji Shono, Saitama; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 619,124, Oct. 2, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 934,747

Claims priority, application Japan, Oct. 4, 1974, 49/120083[U]

Int. Cl.² G03B *7/08, 17/20*

U.S. Cl. 354—53 **4 Claims**



1. A camera having an essentially rectangular viewfinder, a variable sized iris to control lens opening, a variable rate shutter to control the exposure time, an exposure system to provide an analog output signal based upon the brightness of the camera subject and film speed setting, a control circuit responsive to said output signal for simultaneously and automatically controlling both the iris size and the shutter speed, and a display means positioned within said camera to be seen through the viewfinder of said camera, said display means comprising a first array of visual indicators with alpha-numeric designations representative of the aperture opening values, a second array of visual indicators with alpha-numeric designations representative of the shutter speed values, said first and second arrays being juxtaposed within the viewfinder and arranged so that the visual indicators on said first array are adjacent to respective ones of the visual indicators on said second array, each pair of visual indicators composed of one indicator from said first array and the adjacent indicator from the second array corresponding to a different exposure value according to a predetermined pattern of exposure values, and means responsive to said output signal for selectively illuminating a single pair of said visual indicators composed of one indicator from said first array and the adjacent indicator from said second array which corresponds to the exposure value of the iris size and shutter speed controlled by said control circuit..

4,181,412

OPTICAL EXPOSURE MEASURING SYSTEM FOR PHOTOGRAPHIC CAMERAS

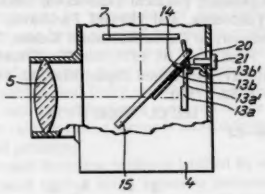
Werner Holle, Wetzlar, and Dietrich Bruckner, Nauborn, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 762,645, Jan. 26, 1977, abandoned. This application Feb. 15, 1978, Ser. No. 877,881

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605955

Int. Cl.² G03B *7/08, 19/12*

U.S. Cl. 354—23 R **7 Claims**



1. In a single lens reflex camera having a housing, said housing being provided with an objective located along an optical axis and an exposure meter including a photosensitive element adapted to receive light through said objective, said housing being further provided with pivot means and a reflex mirror having one end pivoted on said pivot means; said reflex mirror having a semi-transparent area along said optical axis, said reflex mirror upwardly swingable before picture taking, the improvement comprising:

a bipartite honeycomb mirror jointly mounted with said reflex mirror on said pivot means, said honeycomb mirror being located behind said reflex mirror along said optical axis and in front of the film plane of said single lens reflex camera while in metering position, and being upwardly swung together with said reflex mirror before picture taking.

4,181,413

ELECTRONIC SHUTTER CONTROL CIRCUIT

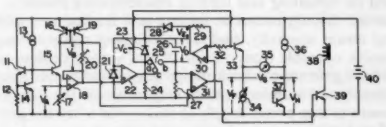
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 944,213

Claims priority, application Japan, Sep. 22, 1977, 52/114134

Int. Cl.² G03B *7/08*

U.S. Cl. 354—24 **10 Claims**



1. A control circuit for a camera having a shutter mechanism, comprising;

(a) a first operational amplifier having a pair of input terminals and an output terminal;

(b) a light receiving element connected between said input terminals of the amplifier, said element having an anode and a cathode;

(c) a logarithmic compression diode, said diode having first and second terminals, said first terminal being connected to the cathode of said light receiving element;

(d) an integrating capacitor having first and second terminals, said first terminal of said capacitor coupled to the cathode of the light receiving element and, the second terminal of both said capacitor and said compression diode

being coupled to the anode of said light receiving element; and

(e) timing switch means operable in synchronization with said shutter mechanism to selectively couple the output terminal of said first operational amplifier to either said second terminal of the compression diode or to said second terminal of the capacitor.

4,181,414

SELF DEVELOPING CAMERA WITH FILM FEEDOUT CONTROL

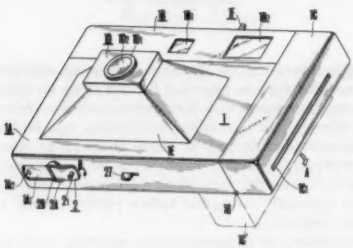
Fumio Ito; Mutsuhide Matsuda, both of Yokohama; Ryoichi Suzuki, Kawasaki; Tokuichi Tsunekawa; Takashi Uchiyama, both of Yokohama, and Hiroshi Furukawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,480

Claims priority, application Japan, Mar. 12, 1976, 51/27566; Mar. 12, 1976, 51/27570

Int. Cl.[2] G03B *17/53*

U.S. Cl. 354—83 **23 Claims**



1. A camera device of the self developing type using photo-sensitive sheet material having a means to store developer liquid and forming a visible image after a processing by said developer liquid in said storage bag after exposure, comprising:

(a) a power source circuit to actuate said camera device;

(b) a first device for covering exposure and permitting exposure of the sheet material; and

(c) a second device coupled to the first device for holding the sheet material, having:

feeding and removing means to advance said photo-sensitive material after exposure and to process said exposed photo-sensitive material with the developer liquid during the advance as well as to remove the material from said second device;

a first driving means having a motor coupled to the conductive means to be driven by the power of the power source and for actuating said feeding and removing means;

a second driving means to actuate said feeding and taking out means manually, said second driving means having a handle operable from outside of said second device; and

a checking means to check the power of said power source circuit, and stopping means responsive to the checking means to stop power supply to said motor when the power of said power source circuit is not enough to operate said motor at a prescribed speed.

4,181,415

CAMERA

Takashi Uchiyama, Yokohama; Ryoichi Suzuki, Kawasaki; Tokuichi Tsunekawa; Fumio Ito; Mutsuhide Matsuda, all of Yokohama, Japan, and Hiroshi Furukawa, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,479

Claims priority, application Japan, Mar. 12, 1976, 51-27574

Int. Cl.[2] G03B *15/05, 17/04, 17/52*

U.S. Cl. 354—86 **31 Claims**

1. A camera using means containing a developing solution and a sheet of light sensitive material on which a visible image is formed after treatment by the processing solution in the containing means after exposure, comprising;

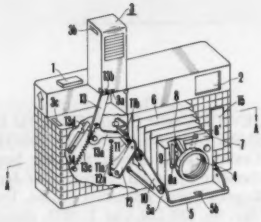
(a) a power source for the camera,

(b) a first device for exposing the sensitive plane of the sensitive material,

(c) a second device in which the sensitive material is loaded, said second device including;

feed means for advancing the sensitive material after exposure, processing the exposed sensitive material with the processing solution during the advancement and carrying the processed sensitive material out of the second device, said feed means having a motor driven with the current from the power source,

a flash unit movable to an operating position at which the unit projects from the second device for operation and to an inactive position at which the unit is loaded in the second device out of operation,



flash unit responsive switch means between the source and the flash unit for opening upon movement of the flash unit into the inactive position, and

(d) connecting means for connecting the first device with the second device, said connecting means having a first state in which the first device is spaced from the second device at a distance suitable for photographing and in a second state in which the first device is kept in close contact with the second device, and further including means for preventing the unit from assuming the operative position when said connecting means is in the second state,

the second device including means for prohibiting current supply to the flash unit from the power source when the feed means is in operation.

4,181,416

DATA PRINTER FOR A CAMERA

Syohei Ohtaki, Yokohama; Keiko Kondo, Tokyo; Zenzo Nakamura, Urawa, and Youichi Okuno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,941

Claims priority, application Japan, Oct. 14, 1975, 50-123608; Nov. 6, 1975, 50-133307; Dec. 17, 1975, 50-151144

Int. Cl.[2] G03B *12/24, 15/05*

U.S. Cl. 354—106 **2 Claims**

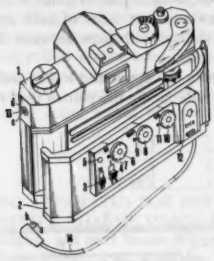
1. A photographic data recording device for a camera for photographically recording some data on film together with a photographing image, the device comprising:

a capacitor;

electric charging means including a power source, a synchro-switch, which operates in correspondence with the shutter release, a converter and switching means connected between the converter and the power source, said switching means connecting the power source to the converter in correspondence with the closing of the synchro-switch to start electric charging;

electronic light flashing means which emits a flash of light in response to electric discharge by said capacitor to illuminate the data at an intensity corresponding to the electric charge potential of said capacitor; and

controlling means which automatically causes said capacitor to discharge electricity so as to allow the electronic light flashing means to emit a flash of light when electric charge



in the capacitor reaches a preset level of electric potential and which prevents the capacitor from discharging when the electric charge is below the preset level of potential.

4,181,417

SHUTTER OPERATION CONTROL DEVICE FOR A PHOTOGRAPHIC CAMERA

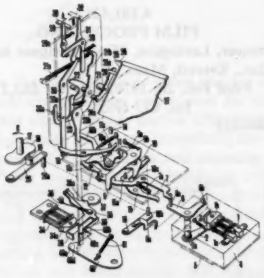
Yoji Sugiura, Yokohama; Nobuo Tezuka, Tokyo; Ryoichi Yoshikawa, and Uchidoi Masanori, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,352

Claims priority, application Japan, Mar. 16, 1977, 52/28968; Apr. 15, 1977, 52/43342

Int. Cl.[2] G03B *19/12, 9/08, 9/64*

U.S. Cl. 354—152 **14 Claims**



1. A faulty operation preventing device for a single lens reflex camera comprising:

(a) mirror drive means;

(b) shutter opening control means; said means being actuated in response to movement of said mirror drive means;

(c) actuating means for actuating said mirror drive means;

(d) electromagnetic release means for causing operation of said actuating means to start;

(e) electrical power supply means;

(f) voltage detecting means positioned between said electrical power supply means and said electromagnetic release means and responsive to whether or not the voltage of said electrical power supply means is above a predetermined level for permitting the supply of electrical power to said electromagnetic release means when the voltage is above the predetermined level and for preventing the supply of electrical power to the electromagnetic release means when the voltage is below the predetermined level;

(g) exposure time determining means connected to said power supply means; said means being actuated in response to drive of said shutter opening control means and producing a shutter closing signal after a certain time;

(h) electromagnetic means connected to said exposure time determining means; said means being set by the shutter closing signal of said exposure time determining means from an energized state to a de-energized state;

(i) movable means movable between a position where it is attracted to said electromagnetic means and a position where it is separated from said electromagnetic means;

(j) shutter closing control means; said means being latched when said movable means is in the attraction position and being released from the latching connection to be actuable when said movable means is in the separate position; and

(k) detecting means movable from a first position to a second position in response to movement of said mirror drive means; said means being latched by said movable means when said movable means is moved to the separate position before said detecting means is moved from the first to the second position, and being unlatched by said movable means when said movable means is moved to the separate position after said detecting means is moved from the first to the second position;

whereby when said detecting means is latched by said movable means, said mirror drive means is prevented from moving so that said shutter opening control means is not actuated.

4,181,418

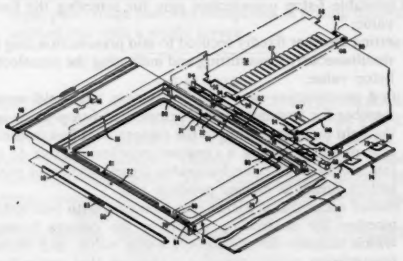
FILM SHEET CASSETTE

Harold F. Fechtner, Glen Farms, Md., and Bruce E. Owens, Loomis, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 741,037, Nov. 11, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,192

Int. Cl.[2] G03B *17/26*

U.S. Cl. 354—277 **7 Claims**



1. A cassette comprising:

a frame defining at one end an entrance for a film sheet and in one side an exposure aperture,

a pressure plate,

spring means engaging the pressure plate for holding it against the frame to hold all edges of a film sheet over said aperture,

said pressure plate having at least one cam follower,

cam rod means defining at least one cam surface,

means mounting the cam rod means on the frame for linear movement with respect thereto between first and second positions,

said cam surface being positioned and shaped to move the cam follower and hence said pressure plate away from the aperture as the cam rod means moves to its second position,

a light shield disposed adjacent said film sheet entrance for preventing the passage of light through said entrance when said cam rod means is in its first position,

said frame defining elongated guide tracks along the sides of said exposure aperture and an access slot at its other end, and

a slide plate adapted to be slideably insertable through said access slot into said guide tracks for blocking the passage of light through said aperture.

4,181,419

INTERCHANGEABLE LENS FOR SLR-CAMERAS HAVING TTL LIGHT METERING

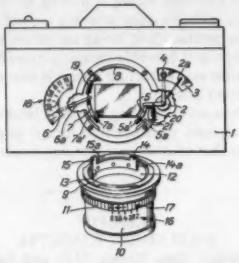
Werner Schlapp, Asslar, and Willi Wiessner, Wetzlar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 850,011

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651263

Int. Cl.² G03B *17/18*

U.S. Cl. 354—286 **3 Claims**



1. A lens assembly adapted for use as an interchangeable lens on a camera housing which includes TTL light metering on open aperture and means for indicating the preselected f-stop value, said lens assembly comprising:

a lens arrangement;

a rotatable f-stop preselection ring for selecting the f-stop value;

a setting member fixedly secured to said preselection ring for simultaneously transmitting and indicating the preselected f-stop value;

a first transmission means in connection with said setting member for transmitting the preselected f-stop value into the light metering means of the camera, said first transmission means assuming a constant position relative to the lens mount in all interchangeable lenses when said preselection ring is in its base position; and

a second transmission means in connection with said setting member for controlling means in the camera housing which indicate the preselected f-stop value, said second transmission means assuming a position that varies from interchangeable lens to interchangeable lens in accordance with the maximum f-stop value of the lens assembly, when said preselection ring is in its base position.

4,181,420

DEVELOPMENT DEVICE FOR DEVELOPING SHEETS OF DIAZO COPYING MATERIAL

Erich Blume, Wiesbaden, and Eberhard Schornig, Taunusstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,438

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659486

Int. Cl.² G03D *7/00*

U.S. Cl. 354—299 **5 Claims**

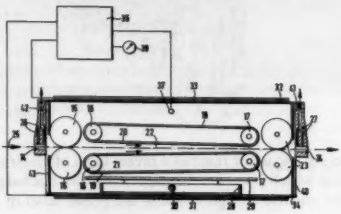
1. A development device for developing sheets of diazo copying material, at a lower and a higher development temperature, in particular microfiches, comprising a substantially gas-tight, closed development chamber adapted to contain a developer medium composed of ammonia gas and water vapor,

a pair of feed rolls at a feed opening, a pair of delivery rolls at a delivery opening and a first and a second pair of guide rolls in said chamber next to the pair of feed rolls and the pair of delivery rolls,

an upper and a lower gas-permeable endless belt guided around one roll of each pair of guide rolls in each case,

a space between adjacent sides of said upper and lower endless belts aligned with gaps between the pairs of feed and delivery rolls,

said space between the upper and lower endless belts being greater at the side facing the pair of feed rolls than at the



side facing the pair of delivery rolls whereby the space between the adjacent sides is wedge-shaped,

means for presetting the peripheral speed of the feed rolls independently of the development temperature, and means to set, at a higher development temperature, the circulation speed of the endless belts at a circulation speed equal to the peripheral speed of the pair of said feed rolls, and to reset, at a lower development temperature, the circulation speed of the endless belts to a speed lower than the peripheral speed of the pair of feed rolls.

4,181,421

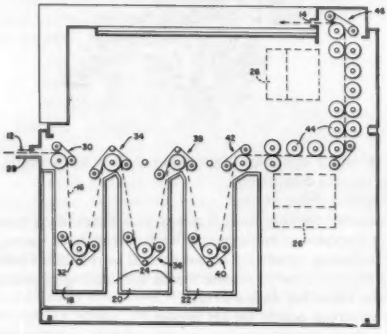
FILM PROCESSING

Samuel Kitrosser, Lexington, Mass., assignor to Cordell Engineering, Inc., Everett, Mass.

Filed Feb. 28, 1978, Ser. No. 882,274

Int. Cl.² G03D *3/13*

U.S. Cl. 354—321 **7 Claims**



1. Photographic processing apparatus comprising,

at least first and second tanks in series with upper edges arranged so that the upper edge of said first tank is adjacent to an upper edge of said second tank,

a series of belted self-threading transport means located at the upper edges of each of said tanks for guiding material to be processed into and from said tanks,

and first and second belted self-threading transport means at the bottom of said first and second tanks respectively for accepting downwardly moving material to be processed

and turning said material around and directing it upward to the next in said series of belted self-threading transport means,

each of said belted self-threading transport means comprising, first driving roller means for providing driving power,

and an endless idling belt in contact with said driving roller and surrounding at least first, second and third contacting spaced idling rollers each spaced from said driving roller by a distance greater than the belt thickness so that the belt is free of being pinched between said rollers,

said first driving roller means being outside said endless idling belt.

4,181,422

PROCESS AND APPARATUS FOR DEVELOPING AND CLEANING A CHARGE IMAGE CARRIER

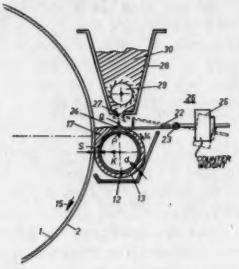
Gabor Forgo, Zürich, and Karl Moser, Forch, both of Switzerland, assignors to Elfotec A.G., Zumikon, Switzerland

Filed May 13, 1977, Ser. No. 796,600

Claims priority, application Fed. Rep. of Germany, May 17, 1976, 2621912

Int. Cl.[2] 355 *15;* **G03G** *15/09, 21/00*

U.S. Cl. 355—3 DD **6 Claims**



1. A process for developing a latent charge image on a repeatedly usable charge image carrier and for cleaning the repeatedly usable charge image carrier after transfer of the developed charge image therefrom, comprising developing the latent charge image on said carrier and cleaning the charge image carrier after transfer of the developed charge image therefrom by applying to the charge image carrier a wedge-shaped thickening of a layer of magnetic one-component toner formed on a magnetic brush during both developing and cleaning and maintaining said wedge-shaped thickening, said layer of toner formed on said brush having said thickening of the layer in the region of contact of the toner layer of the magnetic brush with the charge image carrier, and sensing the thickness of the wedge-shaped thickening of the layer of toner formed on said magnetic brush and controlling the supply of toner to the magnetic brush so as to provide the layer and maintain said thickening of the layer of toner in said region.

4,181,423

ELECTROSTATIC COLOR PRINTING SYSTEMS AND METHODS USING MODULATED ION STREAMS

Gerald L. Pressman, San Jose, and Kenneth W. Gardiner, Menlo Park, both of Calif., assignors to Electroprint, Inc., Sunnyvale, Calif.

Division of Ser. No. 410,743, Oct. 29, 1973, Pat. No. 4,006,983. This application Nov. 8, 1976, Ser. No. 739,403

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—4 **23 Claims**

22. In apparatus for electrostatic multicolor reproductions, the combination of

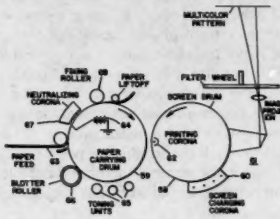
a multilayer screen having at least a screen insulator layer overlaying screen conductor layer;

a dielectric surface moveable between a first position adjacent to and facing said screen and a second position remote from said screen;

means for imposing an electrostatic latent image on said screen in accordance with a single color separation image of a multicolor pattern to be reproduced;

means for supplying a stream of ions through said screen to said dielectric surface whereby said stream is modulated in accordance with the image on said screen to form an electrostatic latent color separation image on said dielectric surface while at said first position;

means for moving said dielectric surface to said second position;



means for developing said electrostatic latent color separation image on said dielectric surface at said second position; and

means for preparing screen to receive the electrostatic latent image, said preparing means operable on said screen while said dielectric surface is at said second position;

so that when multiple color separations of a multicolor separation image are developed in sequence on the dielectric surface, such as upon dielectric paper or on a dielectric transfer surface, reproduction of one separation image may be commenced before reproduction of a prior color separation image has been completed in priting operations carried out with a single screen.

4,181,424

METHOD OF AND MEANS FOR SYNCHRONOUSLY TRANSFERRING ORIGINAL AND COPYING PAPER FOR ELECTROSTATIC PHOTODUPLICATION

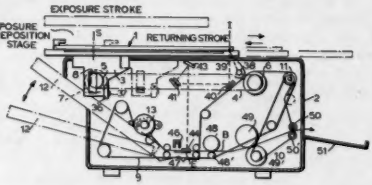
Tetuya Okada, Takatuki; Tadashi Umeda, Gosho; Masahiro Murakami, Shijonawate, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 12, 1978, Ser. No. 915,303

Claims priority, application Japan, Jun. 11, 1977, 52-69748

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **7 Claims**



1. An apparatus for synchronously transferring an original and a sheet of copying paper for electrostatic photo-duplication, said apparatus comprising a mount for holding the original, said mount being mounted for reciprocal movement in said apparatus in a plane parallel to the plane of the original, a driving mechanism connected to the mount for reciprocating the mount at a predetermined speed, means for directing light at an irradiation point along the path of reciprocation of said mount, paper transfer means for feeding a sheet of copy paper along a copying paper transfer path in said apparatus, exposure

means at an exposure point along said transfer path spaced from said paper feeding means in the direction of paper feed, image reflecting means for directing the image from said irradiation point to said exposure point, for optically aligning the exposure point with said irradiation point, paper edge engaging means positioned along said paper transfer path between said transfer means and said exposure point, said paper edge engaging means being movable into and out of the transfer path, said paper transfer means normally being in a condition in which it does not transfer copying paper, and said paper edge engaging means normally being in the transfer path of the copying paper, and operating means connected to said paper transfer means and said paper edge engaging means and actuated in response to movement of said mount for changing the condition of said paper transfer means to a condition for transferring paper and for simultaneously moving said paper edge engaging means out of the copying paper transfer path when said mount has reached a predetermined position along the path of movement thereof at which position the time for the leading edge of the original to reach the irradiation point from said predetermined position is the same as the time for the leading edge of the copying paper to be fed from said edge engaging means to said exposure point.

4,181,425

APPARATUS FOR CLEANING PHOTOSENSITIVE MEMBER

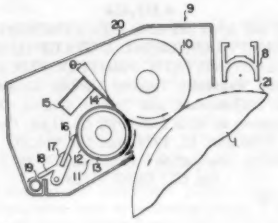
Toshiaki Higaya, Kawasaki, and Kenzo Ariyama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,946

Claims priority, application Japan, Aug. 11, 1976, 51-95595; Aug. 11, 1976, 51-95597; Aug. 12, 1976, 51-108141[U]

Int. Cl.[2] G03G *21/00*; B21B *45/02*

U.S. Cl. 355—15 **9 Claims**



1. An apparatus for cleaning a photosensitive member to remove any residual powder which may remain attached to the surface of the photosensitive member after a transfer step, the apparatus comprising:

a cleaning means having a nonbristled pore-containing surface with a high restoring resilience and rotatably disposed in contact with the surface of the photosensitive member for cleaning residual powder therefrom; and

a pressure means, comprising a plate having an end portion extending in the same direction as the rotation of the cleaning means and disposed against the surface of the cleaning means downstream from the point of contact between said photosensitive surface and said cleaning means in the direction of rotation of the cleaning means for compressing the surface of said cleaning means at a point of contact therebetween, in such manner that the residual powder is expelled from the pores in the surface of said cleaning means by the resilient restoration of said surface after compression.

4,181,426

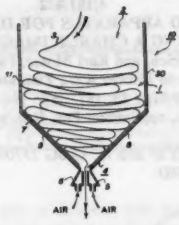
RANDOM-DUMP STORAGE BUFFER FOR MOVING WEB

Daniel F. Blossey, Rochester; Narayan V. Deshpande, Penfield, and Eugene C. Faucz, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 782,122, Mar. 28, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,573

Int. Cl.[2] G03G *15/00, 19/00*; B65H *17/50*

U.S. Cl. 355—16 **1 Claim**



1. Magnetic imaging apparatus for printing collated sets of copies comprising

a continuous magnetic recording web having a length and width of at least 4 inches to accomodate a plurality of latent magnetic images of original documents comprising a set in collated order aligned along the length of the web,

development means for developing the latent magnetic images on the web while the web is moving by depositing a magnetic marking material on the web in the areas corresponding to the latent magnetic images making them visible,

transfer means for transferring the marking material from the web while moving to a copy support member to produce the copies of a collated set and

web transport means for repeatedly moving the web along a closed loop path past the development and transfer means for the serial production of collated sets of copies each revolution of the web about the loop, the length of the loop path being significantly shorter than the length of the web, said transport means including web buffer means including

a collection bin having vertical side walls and sloped bottom walls defining a web storage cavity including a triangular shaped cavity formed by the sloped bottom walls, the sloped walls being spaced apart near the apex of the triangular cavity defining an exit orifice for the web and

blower means for directing pressurized gas into said exit orifice at opposite sides of a web exiting the bin,

said collection bin having an entrance orifice at the top defined by the vertical side walls located along the closed loop web path to receive the web during a generally downward movement of the web enabling the web to collect in folds between the vertical side walls and the bottom sloped walls,

said sloped bottom walls including ridges to space the folded web from the sloped walls and to promote a gas bearing between the web folds and the sloped walls created by the pressurized gas directed into the bin by the blower means to lower the resistance to movement of the web along the loop path whereby the effects of web width and weight are substantially eliminated yielding smooth almost frictionless movement of the tape from the storage bin.

4,181,427

OPTICAL PROJECTION APPARATUS

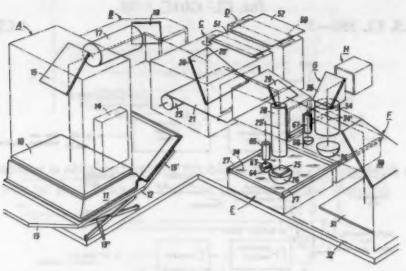
Johann Rotter, Hans Sperlstrasse 16, Salzburg, Austria

Filed Mar. 10, 1978, Ser. No. 885,524

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710736; Jun. 28, 1977, 2729149

Int. Cl.[2] G03B *27/52, 27/70*

U.S. Cl. 355—43 **42 Claims**



1. Optical projection apparatus comprising: housing means; at least single-stage image-forming optical means mounted in said housing means for reducing projection of the image of originals of different formats readable with the naked eye and for re-enlarging projection of the image of micro-originals of different formats; image support means of uniform macroformat arranged to receive the projected images; said image-forming optical means establishing fixed path lengths for optical paths between respective planes of the original and the respective planes of projection, said planes of the original for macro-originals and micro-originals and said plane of projections being offset laterally with respect to one another; and mirror means including means adjustable for deflecting light beams incident thereon from the plane of the macro-original and from the plane of the micro-original alternatively onto the projection plane for macroreproduction, said mirror means providing at least two deflections between said optical means and said projection plane and directing said light parallel to the planes of the originals over at least part of said optical paths.

4,181,428

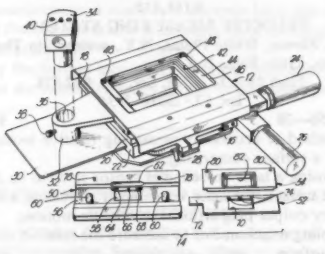
SPECIAL EFFECTS COMPOUND AND SLIDE HOLDER THEREFOR

J. J. Andre Proulx, Ottawa, Canada, assignor to Optical Art Camera Corporation, Ottawa, Canada

Filed Jul. 31, 1978, Ser. No. 929,711

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **16 Claims**



1. A device for use in photographic reproduction equipment for holding a photographic slide, which slide has a plurality of elongated perforations of uniform length and width dimensions, comprising:

a platen base having a generally rectangular light transmission opening extending therethrough;

at least three spaced projecting rectangular pins located adjacent one edge of said opening, each pin having a major dimension and a minor dimension, one of said pins having its major dimension equal one of the length or width dimension of a slide perforation and having its minor dimension less than the other of the length or width dimension of a slide perforation, each of the others of said pins having its major dimension equal to the other of the length or width dimension of a slide perforation and having its minor dimension less than the one of the length or width dimension of a side perforation;

a release plate having at least three spaced openings for registry with corresponding ones of said pins and having a light transmission opening alignable with said platen base light transmission opening; and

a platen having means for accurate positioning thereof on said platen base and having a light transmission opening alignable with said light transmission openings of said platen base and said release plate;

whereby a slide may be sandwiched between said release plate and said platen and then positioned on said platen base with said pins projecting through said release plate openings and corresponding perforations in a slide.

4,181,429

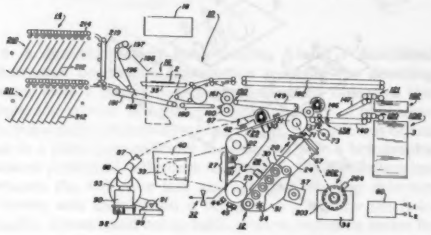
SAMPLE COPY SYSTEM FOR XEROGRAPHIC REPRODUCTION MACHINE

Phillip J. Batchelor; Kenneth W. Laskowski; Gerald A. Gray, Jr.; Stephen P. Wilczek, all of Fairport; Henry E. Mannella, Webster, and Edward L. Steiner, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,028

Int. Cl.[2] G03B *15/00, 27/32*

U.S. Cl. 355—77 **2 Claims**



1. In the method of processing a copy run in a reproduction system having an automatic original feeding apparatus, a copy processor adapted for both simplex and duplex modes of operation and a programming means for preselecting the number of copies of each original to be produced whether as simplex or duplex copies, and wherein one or more originals are automatically fed to a copy position from a stack of originals in the apparatus and returned to the stack after imaging thereof by the processor, and while at the copying station copies a preselected number of times while permitting copy quality to be checked automatically during the copy run, the steps which comprise:

a. activating the document feeding apparatus for transporting an original from the stack of originals and into copying position;

b. retaining said original in said copying position while imaging thereof is performed;

c. activating the document feeding apparatus for removing said original from said copying position and returning the same to the stack when imaging thereof is completed preparatory to the feeding of another original to the copying position; and

d. repeating steps a, b, and c for succeeding originals until copying of the last original is completed and said copy run processed;

e. selectively interrupting steps a, b, and c to make an extra copy of the original in said copying position as a sample of the copies being produced;

f. resuming steps a, b, and c at the point of interruption to continue said copy run;

g. making copies from one original on one side of copy sheets;

h. refeeding said copy sheets and making copies from a second original on the other side of said copy sheets;

i. repeating steps g and h until said copy run is completed;

j. interrupting steps g and h to make an extra copy of an original on one side of a copy sheet;

k. refeeding said copy sheet and making a copy from the same original on the opposite side of said copy sheet;

l. discharge said copy sheet to check copy quality; and

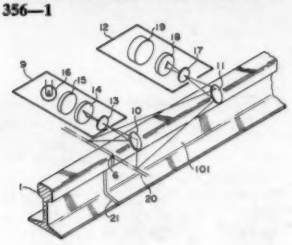
m. resuming steps g and h at the point where said copy run was interrupted.

4,181,430

METHOD AND APPARATUS FOR OPTICAL METHOD OF MEASURING RAIL DISPLACEMENT

Yasushi Shirota, Yokohama; Satoru Kishimoto, Higashikurume; Kunio Takeshita, Hachioji, and Yoshio Ando, Fujisawa, all of Japan, assignors to Japanese National Railways, Tokyo, Japan

Filed Feb. 19, 1976, Ser. No. 659,556
Claims priority, application Japan, Mar. 5, 1975, 50/26019
Int. Cl.[2] G01C *3/00;* E01B *29/04*
U.S. Cl. 356—1 **9 Claims**



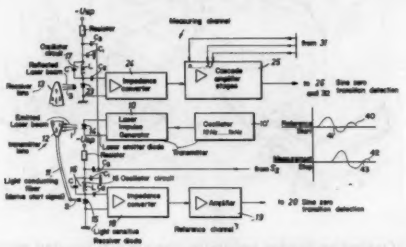
1. Apparatus for optically measuring rail displacement of the rails of a track, comprising a light projector means for mounting on the truck of a railway car above the level of said track for only lateral movement with said truck, said light projector means having a light source and being positioned to direct the light toward one of the rails, the light projector means shaping the light from the light source into a beam which is converged on a measuring axis connecting the points on the sides of the heads of the rails of the track as to which displacement measurement is being made and along a length of the measuring axis which includes the position of the measuring point on the side of the head of said one rail with said one rail in the proper position, the light falling on the side of the head of said one rail at said measuring point in a bright spot or band of light, a light-receiving means for mounting on said truck out of alignment with the axis of the beam of light from said light projector means for receiving an image for sensing the shift of position of the image of the bright spot or band, and comparison means coupled to said light receiving means for comparing the shift of the position of the image with the normal position of said image for determining the amount of shift of said one rail.

4,181,431

LASER DISTANCE MEASURING APPARATUS

Hoiko Chaborski, Munich, Fed. Rep. of Germany, assignor to MITEC-Moderne Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 816,699, Jul. 18, 1977, Pat. No. 4,139,301. This application Oct. 5, 1978, Ser. No. 948,876
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634627
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—5 **4 Claims**



1. A distance measuring apparatus using the transit time of a light impulse to a target and back, comprising reference channel means for providing a starting signal and measuring channel means for providing a stop signal, wherein each of said channels comprises receiver input circuit means, each receiver input circuit means comprising respective light sensitive diode means including a respective barrier layer capacity and working impedance means operatively connected to the respective light sensitive diode means, said working impedance means comprising a parallel resonance circuit including an inductance coil and external capacity means and means operatively connecting said barrier layer capacity of the respective light sensitive diode means in parallel to said parallel resonance circuit, said apparatus further comprising light beam generator means, first optical means for directing light from said light beam generator means onto said light sensitive diode means of the input circuit means of the reference channel means, second optical means for directing light returned from said target onto said light sensitive diode means of the input circuit means of the measuring channel means whereby said light sensitive diode means are optically triggered to generate respective sine waves in the respective parallel resonance circuit, first means for detecting the first zero passage of the sine wave in said reference channel means, and second means for detecting the second zero passage of the sine wave in said measuring channel means.

4,181,432

VELOCITY MEASURING SYSTEM

Robert A. Flower, White Plains, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 18, 1978, Ser. No. 952,374
Int. Cl.[2] G01P *3/36*
U.S. Cl. 356—28 **9 Claims**

9. A method of accurately measuring relative motion with respect to a surface comprising:

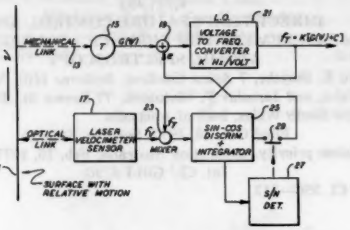
(a) disposing a laser velocimeter sensor so as to be directed at the surface, the laser velocimeter providing a first frequency output proportional to relative motion;

(b) coupling a tachometer to measure the relative motion of said surface;

(c) converting the output of said tachometer to a frequency proportional to said relative motion; and

(d) using the output of said laser velocimeter sensor to correct the output of said tachometer whenever relative velocity is below a pre-determined value which is the

minimum at which said laser velocimeter sensor operates properly, whereby the accuracy of the laser velocimeter sensor is obtained but the problems associated therewith at low or zero velocity and due to dropout are avoided.

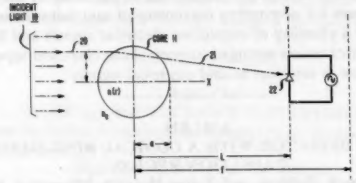


4,181,433

METHOD FOR DETERMINING THE REFRACTIVE INDEX PROFILE OF OPTICAL FIBERS AND OPTICAL FIBER PREFORMS

Dietrich Marcuse, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 14, 1978, Ser. No. 896,347
Int. Cl.[2] G01N *21/22, 21/46*
U.S. Cl. 356—73.1 **3 Claims**



1. A method for determining the refractive index profile of an optical fiber and an optical fiber preform comprising the steps of:

immersing said fiber/preform in an index matching medium;

illuminating said fiber/preform;

measuring, along a direction transverse to the longitudinal axis of said fiber/preform, the intensity distribution of radiant energy focused by said fiber/preform;

CHARACTERIZED IN THAT

said measurement is made at a distance from the center of said fiber/preform that is less than the focal length of said fiber/preform;

and by the further step of determining from said measurement the refractive index profile of said fiber/preform.

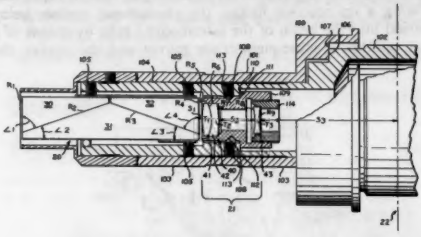
4,181,434

COLOR COMPENSATION SYSTEM FOR ABBE REFRACTOMETER

Robert J. Meltzer, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jun. 2, 1977, Ser. No. 802,741
Int. Cl.[2] G01N *21/46*
U.S. Cl. 356—137 **4 Claims**

1. A method of reducing undesirable deviation caused by imperfections in a color-compensating prism of an Abbe refractometer having a reticle which comprises decentering a lens, located between the prism and the reticle, in a direction and by an amount effective to substantially cancel the undesirable deviation.

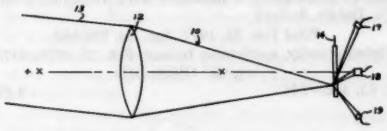


4,181,435

HOLOGRAPHIC FIELD LENS DETECTOR

Tommy L. Williamson, Kettering, and Harold W. Rose, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1973, Ser. No. 373,527
Int. Cl.[2] G01B *11/26;* G02B *5/18*
U.S. Cl. 356—141 **2 Claims**



1. A detection system for providing X and Y directional information concerning illumination reaching the detecting system from a distant source comprising: an objective lens adapted to receive said illumination; a plurality of photoelectric point detectors equally spaced around the optic axis of said lens in a plane perpendicular to said optic axis; a holographic element positioned in the back focal plane of said objective lens between the objective lens and the photoelectric detectors whereby said illumination is brought to a spot on the holographic element; said holographic element including means for imaging the energy from the aperture of said objective lens simultaneously onto the separate photodetectors with the energy on each detector being a function of the position of the spot on the holographic element and means responsive to the output of said detectors for providing an X output signal and a Y output signal.

4,181,436

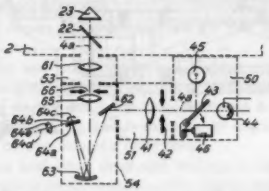
MICROSCOPE SCANNING ACCESSORY FOR A PHOTOMETER

Heiko Wasmund, Asslar, and Walter Klein, Wissmar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 724,853, Sep. 20, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,107
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542731
Int. Cl.[2] G01J *1/42;* G02B *21/00;* H01J *31/49*
U.S. Cl. 356—225 **16 Claims**

2. A scanning accessory for a microscope photometer in combination with a microscope having an intermediate tube with a beam therein, a photometer system mounted to or inside the intermediate tube and having a measurement stop and a

measurement path deflected from the beam, the intermediate tube is provided near or at the one end of its lower side with a coupling system for mounting to a stand and at the opposite side with a coupling system for mounting an ocular, the ocular viewing a microscope image, the photometer system being inserted into the beam of the intermediate tube by means of a beam splitter, a subsequent triple mirror and the ocular, the



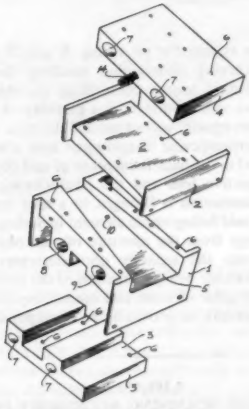
improvement comprising: means for periodically changing the relative position of said measurement path (*4a*) and an image (*76a, 76b*) of said measuring stop (**42**) with respect to said microscope image (**72**), said means provided between said photometer system (**41–46**) and said beam splitter (**22**) mounted inside said intermediate tube (**2**) for the purpose of enlarging the application possibilities of said microscope photometer.

4,181,437

APPARATUS FOR EXAMINING THE INFRARED SPECTRUM OF SMALL QUANTITIES OF MATERIALS IN THE VAPOR PHASE

Valentine J. Rossiter, 16 Rathmore Ave., Kilmacud, Stillorgan, Co. Dublin, Ireland

Filed Feb. 22, 1977, Ser. No. 770,865
Claims priority, application Ireland, Feb. 25, 1976, 367/76
Int. Cl.[2] G01N *1/00*
U.S. Cl. 356—246 **3 Claims**



1. A spectral cell for the spectroscopic analysis of materials comprising in combination

a pair of elongated interior body members secured together to form an elongated tubular interior portion having an internal tapered rectangular cross-sectional area the dimensions of which are arranged to follow the optical beam of a particular spectrometer;

a trapping chamber for reception of a trapped sample integral with one of said body members;

means for communicating between said trapping chamber and said interior portion

heating means incorporated in an exterior body member;

cooling means incorporated in an exterior body member;

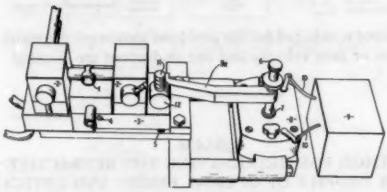
an infrared permeable window at each end of the tubular interior portion; and an external purging means in communication with the interior of the cell.

4,181,438

DIRECT TEMPERATURE CONTROL AND MEASUREMENT FOR FURNACE ATOMIZERS IN ATOMIC SPECTROSCOPY

Lloyd E. Smythe, 7 Aston Gardens, Bellevue Hill, New South Wales, and Jaroslav P. Matousek, 77 Brown St., Forestville, New South Wales, both of Australia

Filed Oct. 28, 1977, Ser. No. 846,326
Claims priority, application Australia, Feb. 10, 1977, PC9027
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—312 **2 Claims**



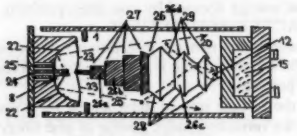
1. Apparatus for controlling the power delivered to an electrically heated furnace atomiser for use in atomic spectroscopy and thus controlling the temperature of the furnace, consisting of means moveable to a plurality of different positions in response to dimensional changes of the furnace due to thermal expansion and contraction connected to the body of the furnace, means for converting movement of said last-mentioned means to a plurality of respective electrical signals and feedback control means arranged to control the electrical input to the furnace in response to said electrical signals.

4,181,439

SMOKE DETECTOR WITH A CONICAL RING-SHAPED RADIATION REGION

Erwin Tresch, Zollikon, and Zoltan Horvath, Männedorf, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Mar. 14, 1977, Ser. No. 777,397
Claims priority, application Switzerland, Apr. 1, 1976, 4040/76; Sep. 6, 1976, 11278/76
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—338 **27 Claims**



1. A smoke detector comprising: a radiation source comprising a radiation emitting element for emitting radiation throughout an extended spatial region;

said radiation source further comprising optical means structured to focus the predominant part of the radiation into a substantially conical ring-shaped radiation region in order to thereby increase the efficiency of smoke detection;

a radiation receiver arranged to receive radiation scattered by particles located in the substantially ring-shaped radiation region; and

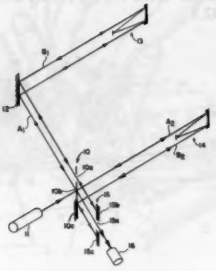
said radiation receiver being located substantially along the cone axis.

4,181,440

OVER-UNDER DOUBLE-PASS INTERFEROMETER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Rudolf A. Schindler, Sierra Madre, Calif.

Filed Dec. 8, 1977, Ser. No. 858,596
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—346 9 Claims



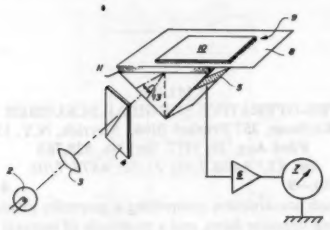
5. In an over-under double-pass interferometer, an optical configuration which allows a single flat plate to be used for a beamsplitter reduced in thickness to conform only with considerations of optical flatness comprising two retroreflectors with their spatial reflection orientation arranged so that one retroreflector is in a plane offset from the other retroreflector in order that the double-pass retroreflected beams combine at said beamsplitter with the axes of the two double-pass retroreflected output beams coincident at the beamsplitter in a plane between the single-pass reflected beams of the two retroreflectors.

4,181,441

INTERNAL REFLECTANCE SPECTROMETER

Hans G. Noller, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 7, 1977, Ser. No. 858,308
Int. Cl.[2] G01J 3/48; G01N 21/02
U.S. Cl. 356—414 6 Claims



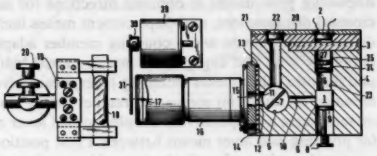
1. an internal reflectance spectrometer comprising:
(a) a prism adaptable for optically coupling a test sample to one surface thereof; forming a sample-prism boundary
(b) a means for irradiating the test sample with light of wave length absorbed by the test sample, said means directing light to enter the test sample from the prism surface having said test sample thereon such that said light forms an angle with said boundary between the critical angle and about 35 less that the critical angle, said light being refracted in the test sample so that said light is internally reflected from the test sample remote from said boundary; and
(c) a means for detecting internally reflected light.

4,181,442

APPARATUS FOR DETERMINING AMINO ACIDS

Ernst-Georg Niemann, Garbsen, and Bernd Georgi, Hanover, both of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH, Munchen, Neuherberg, Fed. Rep. of Germany

Division of Ser. No. 799,121, May 20, 1977. This application Feb. 15, 1978, Ser. No. 877,985
Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622547
Int. Cl.[2] G01N 21/52
U.S. Cl. 356—417 5 Claims



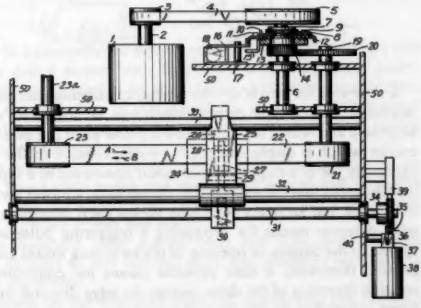
1. Apparatus for measuring fluorescence comprising
(a) a metal block having a first recess for a sample mount and a second recess for a beam divider;
(b) a receiving bore connecting both recesses and extending axially from the metal block;
(c) a radiation source and an optical focusing device to introduce radiation into the receiving bore;
(d) a first exit bore extending at an angle from the first recess and through which can pass fluorescent radiation emitted by a sample in the sample mount;
(e) a second exit bore extending at an angle from the second recess and through which can pass radiation reflected by the beam divider;
(f) a first detector at the first exit bore for detecting fluorescent radiation; and
(g) a second detector at the second exit bore for detecting reflected radiation.

4,181,443

DRIVE MECHANISM FOR A RECIPROCATING PRINTER CARRIAGE

Tetsuro Hirabayashi, and Hiromi Shishiuchi, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,502
Claims priority, application Japan, Dec. 9, 1976, 51-147963
Int. Cl.[2] B41J 19/22
U.S. Cl. 400—320 20 Claims



1. A printer for printing on print tape means comprising:
a frame;
print means slideably mounted on said frame for reciproca-

tive displacement across the tape means for effecting printing in at least one direction of said displacement;

unidirectional drive means mounted on said frame;

two spaced apart pulleys rotatably mounted on said frame, one of said pulley selectively operatively coupled to said drive means;

an endless belt having two runs mounted on said pulleys, said endless belt formed with engagement means;

clutch means for selectively operatively coupling said one pulley to said drive means; and

displacement means selectively operatively coupling said print means to said belt at either of said runs for selectively displacing print means in opposed directions for said reciprocal displacement, said displacement means including direction shift means and a coupling member adapted to cooperate with said engagement means on said belt runs, said direction shift means including lever means pivotally mounted on said print means and ratchet means mounted on said frame and operatively coupled to said lever means for pivoting said lever means between a first position and a second position for displacing said coupling means mounted on said lever means from engagement with one of said belt runs.

4,181,444

DEVICE FOR PRINTING OUT INDICES AND POWERS IN TYPEWRITERS

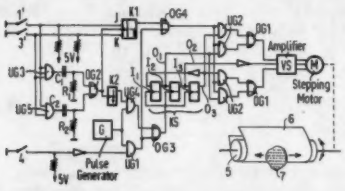
Ulrich Heider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,527

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646964

Int. Cl.[2] B41J *19/76*

U.S. Cl. 400—568 **5 Claims**



1. A device for power-driven typing, calculating, and similar machines with a type carrier which can be triggered via a keyboard and which serves for row-by-row print out on a data carrier which is displaceable row-by-row relative to the type carrier by use of a stepping drive motor connected to a support means supporting the data carrier, comprising: a power switching means and an index switching means each controlling an edge detector means for producing a triggering pulse in response to the closing or opening of the switching means and, in parallel therewith, a state detector means for controlling a rotation direction of the drive motor; the edge detector means being connected to the state detector means and to a time element which drives gate circuit means for the drive of the drive motor; and the state detector means connecting to reversing switching means for the drive motor.

4,181,445

DEVICE FOR SELECTING A LINE TO BE PRINTED IN A PRINTER

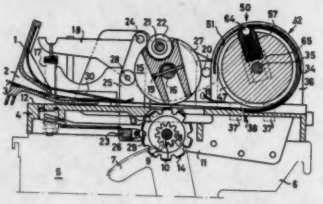
Karl-Heinz Haller, Villingen-Schwenningen, and Helmut Müller, St. Georgen, both of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Dec. 6, 1977, Ser. No. 857,884

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656785

Int. Cl.[2] B41J *11/64, 13/28, 29/42*

U.S. Cl. 400—632.1 **13 Claims**



1. In a device for determining a line to be printed on a record carrier in a printer in which the record carrier can be inserted by an adjustable amount, including a stop member, setting means for adjusting said stop member within a printing range of at least 16 lines and comprising an axially extending setting shaft, a tube shaped card guide element extending arcuately around the axis of said setting shaft and spaced radially outwardly from said setting shaft, said card guide element having an internal surface including a pattern of engageable depressions corresponding to the individual lines of said printing range extending in the direction around the axis of said setting shaft, and said stop member comprising a stop and rest part positioned on said setting shaft and extending radially outwardly toward the internal surface of said guide element and spring means for radially outwardly urging said stop and rest part under spring tension so that the stop and rest part slidingly rests in a depression of said pattern on the internal surface of said tube shaped card guide element and engages with one said depression thereon, for defining the extent of the insertion of the carrier to thereby define the line to be printed.

4,181,446

PRE-OPERATIVE SURGICAL SCRUBBER

Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

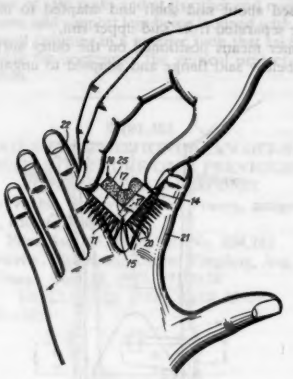
Filed Aug. 29, 1977, Ser. No. 828,763

Int. Cl.[2] A46B *1/00, 11/02;* **A47K** *7/03*

U.S. Cl. 401—9 **4 Claims**

1. A brush construction comprising a generally planar brush back having opposite faces, and a multitude of integral bristles projecting from one face of said brush back, said brush back being self-sustaining in its normally flat condition and being fabricated of a plastic material having flexibility enabling said brush back to be bent or folded upon itself, and being provided with generally circumferential rib means defining upstanding side and end walls stiffening the brush back against bending, said rib means being absent only along a medial region to facilitate the bending of said brush back along said medial region to fold upon itself toward the other face of said brush back to swing said bristles into angular relation with each other for brushing engagement with an internal surface; and a resilient rubbing sponge secured on said other brush back face and conformably engageable within the upstanding side and end walls formed by said generally circumferential rib means;

whereby the flexural action of the plastic material enabling the brush back to be restored to its unflexed condition, and



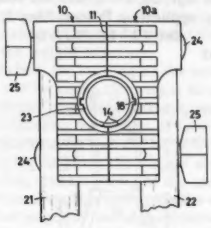
whereby said sponge also serves to enhance the restoring of said brush back to its unflexed normally flat condition.

4,181,447

JOINT FOR TUBULAR STRUCTURAL ELEMENTS PARTICULARLY FOR THE JOINTING OF THE STRUCTURAL ELEMENTS OF HOSE CARRIAGES

Gian F. Roman, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy

Filed Jul. 27, 1978, Ser. No. 928,617
Claims priority, application Italy, Aug. 10, 1977, 22033B/77[U]
Int. Cl.[2] F16B *1/00*; F16L *41/00*
U.S. Cl. 403—4 **3 Claims**



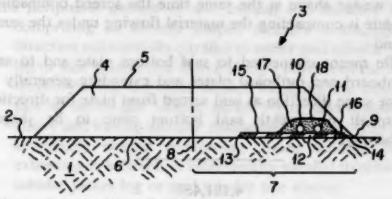
1. A joint for tubular structural elements, particularly for hose carriages, comprising a pair of identical bodies each having a side which matches a corresponding side on the other body, said bodies being arranged with said sides facing each other, said bodies being clamped to one another by releasable clamping means passing through said bodies perpendicularly to the matching sides thereof, each body including a blind-hole seat extending parallel to the respective matching side for receiving a respective tubular element and a central recessed portion in the respective matching side which cooperates with the corresponding recessed portion of the matching side of the other body to define a pass-through seat extending perpendicularly to said blind-hole seats for receiving a further tubular element.

4,181,448

COMBINATION ROADWAY AND PIPELINE WAY IN PERMAFROST REGIONS

Robert A. Crosky, Anchorage, Ala., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 25, 1978, Ser. No. 945,672
Int. Cl.[2] E01C *3/00*
U.S. Cl. 404—27 **9 Claims**



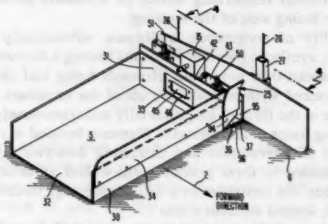
1. A combination roadway and pipeline way for use over permafrost comprising a longitudinally extending roadbed whose bottom area rests on said permafrost, at least one longitudinally extending pipeline embedded in a side area of said roadbed and extending essentially parallel to said roadbed, longitudinally extending insulation means having longitudinal edges, said insulation means being carried in said roadbed between said pipeline and said permafrost, said insulation means extending laterally from both sides of said pipeline a distance sufficient to prevent substantial amounts of heat radiation from passing from said pipeline around said edges of said insulation means and into said permafrost.

4,181,449

PAVING JOINTS

Earl A. Lenker, 2916 Michele Dr., Norristown, Pa. 19403

Filed Aug. 2, 1978, Ser. No. 930,385
Int. Cl.[2] E01C *23/02*
U.S. Cl. 404—87 **16 Claims**



5. In a conventional asphalt paving machine including a side plate and a screed with front, end and compacting plates, apparatus disposed in the space between the machine side plate and the end plate of the screed for creating a longitudinal overlapped, wedge joint between adjacent sections of paving the apparatus comprising:

an inboard plate having means for fixedly securing the inboard plate to the end plate of the screed and extending from the screed front plate back along and co-extensive with the screed end plate;

an outboard plate spaced from and extending generally parallel to said inboard plate and generally co-extensive therewith;

means on the outboard plate for connecting the outboard plate to said machine side plate and providing for relative sliding motion in a vertical direction between the outboard plate and the machine side plate;

a generally planar bottom plate connected to said inboard

and outboard plates and extending from the screed front plate back along and between the inboard and outboard plates and co-extensive therewith, the bottom plate being oriented angularly outwardly from the inboard plate to form a space, wedge-shaped in cross section, above the surface to be paved whereby asphalt flowing under the screed compacting plate will simultaneously flow under the bottom plate to be compacted by the bottom plate into a wedge shape at the same time the screed compacting plate is compacting the material flowing under the same; and

baffle means connected to said bottom plate and to said inboard and outboard plates and extending generally in the same direction as said screed front plate for directing asphalt underneath said bottom plate to be shaped thereby.

4,181,450

EROSION CONTROL MATTING

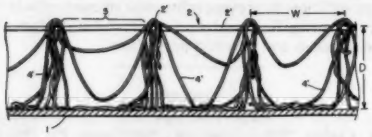
Alfred Rasen; Rolf Vollbrecht, and Klemens Schenesse, all of Obernburg, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 703,277, Jul. 7, 1976. This application Apr. 4, 1977, Ser. No. 784,361

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 7610269[U]

Int. Cl.[2] E02D *31/06*

U.S. Cl. 405—19 **24 Claims**



1. A porous, reinforced, erosion control matting which comprises:

an open-mesh reinforcing lattice or crossbars defining an upper facing side of the matting;

a plurality of continuous, melt-spun, substantially amorphous, synthetic polymer filaments having a diameter of at least about 0.06 mm., said filaments being laid onto and interlocked with substantially all of the crossbars of said lattice in the form of longitudinally and transversely overlapping loops of intermingled filaments bonded at random points of intersection and extending downwardly from said lattice to form porous multi-walled alveolate cells between the crossbars in a self-supporting, three-dimensional, looped structure; and

a soil-retaining, fibrous backing member defining a bottom facing side of the matting arranged approximately parallel to said lattice and at a distance therefrom sufficient to receive at least several millimeters of soil, at least part of the filaments being bonded to said backing member.

4,181,451

DEVICE FOR DISPOSAL OF ANIMAL EXCREMENT

Daniel E. Boehling, 2341 Castlebridge Rd., Midlothian, Va. 23113, and Carl L. Cash, 2730 Tinsley Dr., Richmond, Va. 23235

Filed Aug. 10, 1978, Ser. No. 932,726

Int. Cl.[2] C02C *1/02*

U.S. Cl. 405—128 **7 Claims**

1. A device for the disposal of animal excrement comprising:

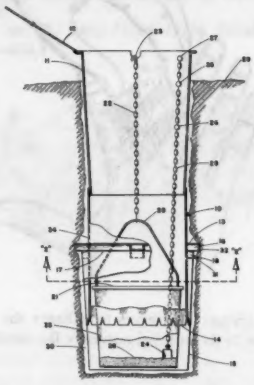
(a) a large bucket having a circular upper rim,

(b) a tubular shaft member provided with closure means at its upper extremity and having at its lower extremity gripping means which engage the inside surface of said large bucket,

(c) an outwardly directed flange disposed about the outer surface of said shaft,

(d) spacer means positioned below said flange and uniformly disposed about said shaft and adapted to maintain said flange separated from said upper rim,

(e) retainer means positioned on the outer surface of said shaft below said flange and adapted to engage the large



bucket adjacent its upper rim in a manner to cause coaxial alignment of said shaft with said large bucket,

(f) a small bucket adapted to fit within said shaft and rest mouth-upward on the bottom of said large bucket,

(g) tether means connecting said small bucket with an upper portion of said shaft, and

(h) sediment measuring means associated with said small bucket and operable from an upper portion of said shaft.

4,181,452

OIL-PRODUCTION PLATFORM AND METHOD OF ASSEMBLING AND INSTALLING THE SAME ON A SEA BED

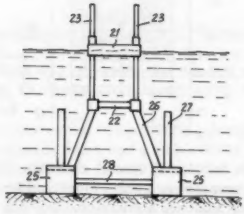
Michel J. Pagezy, and René Loire, both of Paris, France, assignors to Entreprise d'Equipments Mecaniques et Hydrauliques E.M.H.

Filed Apr. 26, 1978, Ser. No. 900,648

Claims priority, application France, May 2, 1977, 77 13159

Int. Cl.[2] E02B *17/08*

U.S. Cl. 405—203 **8 Claims**



1. A device for exploiting an oil-field, e.g. an underwater oil-field, wherein said device comprises an upper structure constituted by an upper exploitation platform and a lower wind-bracing platform, the said platforms being traversed by at least three columns, means for displacing and securing the columns at any relative position with respect to each platform, and a lower bearing structure adapted to rest upon the sea bed comprising a base constituted by two tanks of elongated shape, means for maintaining the tanks parallel to one another and at a certain distance from one another, and means for supporting

the upper structure at a certain height above the tanks, said upper structure supporting means including support legs, each of said support legs being connected at one end region to a respective one of said tanks and at its other end region to said lower platform, said support legs being inclined with respect to the axes of said columns in a manner such that said tanks are located outside the contour of the vertical projection of said lower platform.

4,181,453

APPARATUS FOR POSITIONING AN OFF-SHORE WEIGHT STRUCTURE ON A PREVIOUSLY POSITIONED SEA BED UNIT

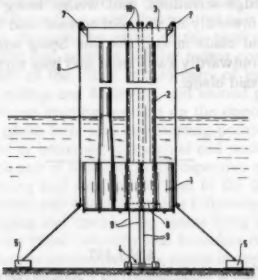
Jean-Claude Vache', Roissy en Brie, France, assignor to Sea Tank Co., Rungis, France

Filed Aug. 16, 1978, Ser. No. 934,282

Claims priority, application United Kingdom, Aug. 24, 1977, 35576/77; France, Dec. 23, 1977, 77 39124

Int. Cl.[2] E02B *17/00;* **B63B** *35/44*

U.S. Cl. 405—203 **10 Claims**



1. Apparatus for positioning an off-shore weight structure on a previously positioned sea bed unit during lowering of the weight structure onto the sea bed, the weight structure comprising a base caisson of reinforced concrete and at least one hollow reinforced concrete tower projecting upwardly therefrom for supporting a work deck out of the water; the apparatus comprising:

co-operating contact means provided on the sea bed unit and in a sea bed unit receiving recess in the lower surface of the base caisson, respectively, said means being provided for mutual guiding engagement during the final stages of lowering of the weight structure;

a plurality of anchors for locating on the sea bed around the sea bed unit and for fixing the weight structure to the sea bed independently of the sea bed unit; and

winch means connecting the weight structure to the anchors in an arrangement such that during lowering, the winch means are usable to guide the weight structure to cause the co-operating contact means of the sea bed unit and of the base caisson to engage and guide the weight structure during the final stages of lowering of the weight structure.

4,181,454

PILE WIPER SEAL

Lloyd C. Knox, and Steven G. Streich, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 20, 1978, Ser. No. 926,365

Int. Cl.[2] E02B *17/00;* **E02D** *5/14*

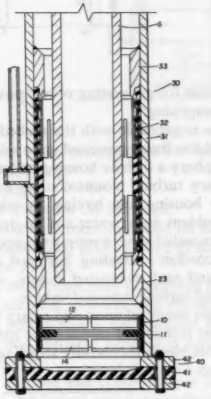
U.S. Cl. 405—227 **7 Claims**

1. A pile wiper seal assembly sealing the annulus between either a tubular jacket leg or tubular pile sleeve having a diaphragm installed thereon and a pile inserted therethrough of a marine platform having the base thereof resting on the bottom of a body of water, said pile wiper seal assembly being utilized to help prevent the debris and mud from the bottom of said body of water from rushing into the portion of the annulus above said pile wiper seal assembly when said diaphragm is ruptured by said pile, said pile wiper seal assembly comprising:

annular seal member means formed of elastomeric material having a solid peripheral portion and a solid sealing portion extending inwardly therefrom in continuous contact with the solid peripheral portion throughout their common periphery thereby forming an annular seal member means containing no voids therein,

the peripheral portion of said annular seal member means comprising an annular shaped member extending in a direction substantially parallel to either said tubular jacket leg or said tubular pile sleeve along a portion of the length thereof having the outer surface engaging the inner surface of either said tubular jacket leg or said tubular pile sleeve and having annular substantially rectangular cross-sectionally shaped reinforcing means secured therein extending in a direction substantially parallel to either said tubular jacket leg or said tubular pile sleeve;

the sealing portion of said annular seal member means comprising an annular shaped member having the outer periphery secured to the inner surface of the peripheral portion of said annular seal member means with the peripheral portion extending on each side of the sealing portion wherein the portion of the peripheral portion of



said annular seal member means extending above the sealing portion of said annular seal means comprises the upper portion thereof while the portion of the peripheral portion of said annular seal member means extending below the sealing portion of said annular seal member means comprises the lower portion thereof and having a bore therethrough the diameter thereof being smaller than the diameter of said pile before the insertion of said pile through said annular seal member means;

upper end shoe means secured to the inner surface of either said tubular jacket leg or said tubular pile sleeve having a recess therein receiving the upper portion of the peripheral portion of said annular seal member means; and

lower end shoe means secured to the inner surface of either said tubular jacket leg or said tubular pile sleeve having a recess therein receiving the lower portion of the peripheral portion of said annular seal member means

whereby said upper end shoe means and said lower end shoe means retain said annular seal member means in either said tubular jacket leg or said tubular pile sleeve and the annular substantially rectangular cross-sectionally shaped reinforcing means prevents the removal of the peripheral portion of said annular seal member means from said upper end shoe means and said lower end shoe means.

4,181,455

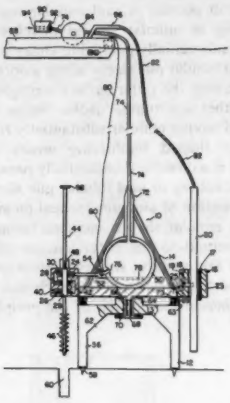
APPARATUS FOR GENERATING ROTARY POWER IN A DEEP-SEA ENVIRONMENT

Tad Stanwick, 4715 Upton St., N.W., Washington, D.C. 20016

Division of Ser. No. 907,062, May 17, 1978. This application May 30, 1978, Ser. No. 910,567

Int. Cl.[2] E02D 13/00

U.S. Cl. 405—232 8 Claims



1. Apparatus for generating rotary power in a deepsea environment comprising:

A. A base engageable with the seabed;

B. A rotatable frame mounted upon said base and defining at its periphery a turbine housing and a pile support closure;

C. A rotary turbine mounted upon a vertical shaft in said turbine housing and having an inlet in communication with ambient underwater and an outlet;

D. An evacuated sphere supported upon said frame, including a conduit extending between said turbine housing outlet and said evacuated sphere, so as to admit water from said turbine into said sphere;

E. An auger mounted upon said rotary turbine vertical shaft, such that rotation of said turbine rotates said drill; and

F. A flexible bleedoff conduit extending from said evacuated sphere to a surface location.

4,181,456

CUTTING TOOL

Ronald R. Oaks, North Tonawanda, N.Y., assignor to Niagara Cutter Inc., North Tonawanda, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,337

Int. Cl.[2] B26D 1/12

U.S. Cl. 407—38 6 Claims

1. A cutting tool, comprising:

a body provided with an elongated slot extending into said body from a surface thereof, said slot being bounded by spaced and facing leading and trailing wall surfaces separated by an intermediate base surface, said wall surfaces being inclined toward each other convergently inwardly of said slot away from said body surface, said base surface being inclined in the direction of such slot elongation;

a blade arranged in said slot and having leading and trailing blade surfaces, said blade having a cooperatively inclined bottom surface adapted to slidably engage said body base surface;

single means holding said blade in said slot including a wedge removably arranged in said slot between said blade and are of said wall surfaces and having leading and trailing wedge surfaces, one of which opposes one of said blade surfaces;

elongated blade serrations on said one blade surface;

elongated serrations on said one wedge surface and interlocking with said blade serrations; and

elongated tongue and groove means arranged between the other of said wedge and wall surface and extending in substantially the same longitudinal direction as said blade and wedge serrations, said wedge being adapted to be driven inwardly of said slot toward said base surface to hold said blade in said slot and being adapted to be removed outwardly away from said base surface of said slot to free said blade.

4,181,457

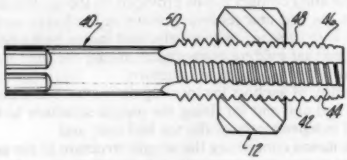
TAPPING TOOL FOR MAKING VIBRATION RESISTANT PREVAILING TORQUE FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018

Filed Feb. 10, 1978, Ser. No. 876,760

Int. Cl.[2] B23G 5/06

U.S. Cl. 408—217 4 Claims

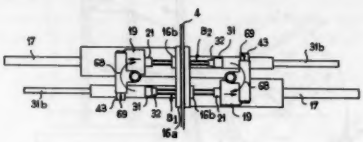


1. A tapping tool for use in forming a female thread form in a previously formed hole and comprising an elongated body having an initial pilot portion and a working length, the working length having a thread form cutter having leading and trailing flanks and being characterized by a substantially constant diameter helical root over the entire length thereof and a first portion of thread form cutting crests of full height and a second portion contiguous with the first portion wherein the crests are uniformly increasingly truncated to less than full height to produce a helical flat of uniform angular relation to the tool axis, the first portion being more remote from the pilot than the second portion and the truncation of the second length increasing toward the pilot portion whereby in use the tap produces a female thread form having a portion of full thread depth contiguous with a portion of increasing truncation in the thread form major diameter but with constant minor diameter over the entire thread form length.

4,181,458
MULTIPLE-BROACH BROACHING MACHINE

Christian Roturier, Fontenay le Fleury, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed May 30, 1978, Ser. No. 910,540
Claims priority, application France, Nov. 4, 1977, 77 33189
Int. Cl.[2] B23D *41/04*
U.S. Cl. 409—265 7 Claims



1. Multiple-broach broaching machine for broaching a pattern of holes in a workpiece comprising at least two pairs of broaches, means coacting with the opposite ends of one of the pairs of broaches for pulling and following that pair from a first starting position through the plane of the workpiece to be broached to a first end position; similar means coacting with the opposite ends of the other of said pairs of broaches for simultaneously pulling and following said second pair of broaches from a second starting position on the opposite side of said workpiece plane from said first starting position through the workpiece to be broached to a second end position, means for gripping each pair of broaches at its respective end position and for transferring said pair end for end to the first starting position of the other pair one pulling, one following means and one of said gripping and transferring means lying in each side of said workpiece plane whereby the broaches of each pair operate by making successive working passes in opposite directions, the workpieces being simultaneously repositionable in the time gap between successive operations of said broaches according to the desired broaching action.

4,181,459
CONVEYOR PROTECTION SYSTEM

Charles A. Price, Portage, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1978, Ser. No. 882,495
Int. Cl.[2] C10B *31/04*
U.S. Cl. 414—161 5 Claims

1. In an apparatus for charging an array of coke ovens forming a coke oven battery, said apparatus including a coal storage container, an enclosed, continuous conveyor for transferring a defined amount of coal from the storage container to a coke oven charging hole associated with said defined amount of coal, said enclosed conveyor overlying the charging holes of the coke ovens;

the improvement, for preventing jamming of the conveyor drive system when at least a portion of said defined amount of coal is not charged into its associated charging hole, which comprises;

sensor means responsive to a predetermined minimum volume of coal on the conveyor, said sensor means being interposed along the length of the conveyor, at a point between the charging hole closest to and the charging hold farthest from said storage container;

time-interval measuring means, initiated by said sensor and preset to be analogous to an excessive volume of coal which would cause such jamming,

means for preventing said time-interval measuring means from being initiated by a sensor, upstream of the coke oven charging hole associated with said defined amount of coal,

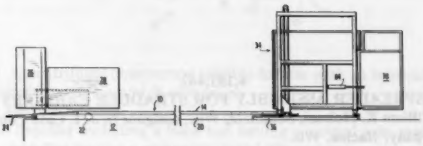
means for comparing (i) the time-interval said sensor is responding to the presence of said predetermined minimum volume of coal on the conveyor with (ii) said preset analogous time-interval, and associated with said comparing means,

means for generating a signal when time-interval (i) is greater than time-interval (ii).

4,181,460
ARTICLE HANDLING APPARATUS

David W. Lutz, R.D. 6 Forge Road Acres, Carlisle, Pa. 17013

Filed Dec. 29, 1977, Ser. No. 865,763
Int. Cl.[2] B65G *67/08*
U.S. Cl. 414—400 8 Claims



1. Apparatus mounted on a loading dock for loading vehicles, said apparatus comprising:

(a) a conveyor comprising:

(i) an elongated base mounted on the dock;

(ii) an elongated shiftable element mounted on said base for movement in a longitudinal path relative to said base and into a vehicle to be loaded;

(iii) reversible drive means operably connected to said base and said shiftable element to effect said movement; and

(iv) first means for restraining a load against longitudinal movement while said shiftable element is retracted from beneath said load; and

(b) second means for aligning and compacting a load on said shiftable element in the lateral and longitudinal directions prior to loading a vehicle, said second means comprising:

(i) a framework straddling said conveyor;

(ii) side walls on said framework on opposite sides of said conveyor;

(iii) third means for expanding said side walls to laterally align and compact loads placed on said conveyor; and

(iv) fourth means for moving said framework longitudinally from one end of said conveyor to the other.

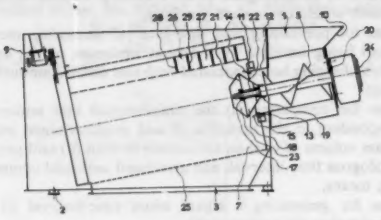
4,181,461
APPARATUS FOR OPENING DISPOSABLE PACKAGING

Jean B. Bernicot, Mulhouse, France, assignor to Vibramec S.A.R.L., France

Filed Mar. 7, 1978, Ser. No. 884,163
Claims priority, application France, Mar. 10, 1977, 77 07750
Int. Cl.[2] B65B *69/00*
U.S. Cl. 414—412 6 Claims

1. Apparatus for opening packaging comprising disposable containers containing a granular product, said apparatus comprising a trommel, a screw for feeding said containers containing the product into the trommel, means carried by said trommel and located at the inlet of the trommel for rupturing said containers to release the product therefrom, and a frustoconical member located inside the trommel and fixed in rotation with the discharge end of the screw to brake the forward

movement of the containers and move the containers radially outwardly to ensure contact of said rupturing means with said containers to release the product, the smaller end of said frusto-



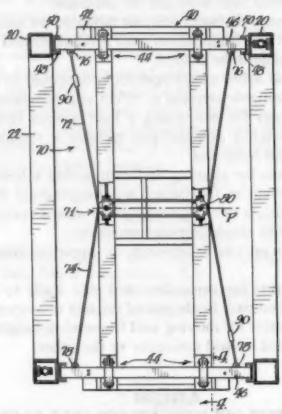
conical member facing the screw and the larger end being directed toward the interior of the trommel, said trommel having means for separating the ruptured containers and product from each other.

4,181,462

SPREADER ASSEMBLY FOR STRADDLE CARRIERS

William K. Holmes, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 24, 1978, Ser. No. 899,517
Int. Cl.[2] B60P *3/00*
U.S. Cl. 414—460 **12 Claims**



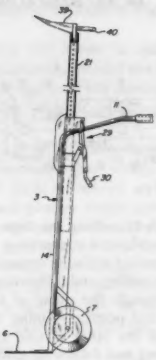
1. In a straddle carrier for transporting containers and including an inverted U-shaped frame defining a container receiving bay, first and second spaced generally parallel horizontal beams guided on said frame for vertical movement in said bay, hoisting means on said frame for raising and lowering said beams and said spreader in said bay, and side shift means between said beams and said spreader, the improvement of first cable means between said first beam and an intermediate portion of said spreader and second cable means between said second beam and an intermediate portion of said spreader, said first and second cable means limiting longitudinal movement of said spreader with respect to said beams while accommodating transverse movement within said bay.

4,181,463

VEHICULAR JACK

Robert A. Mooney, 35 Friendship La., Colorado Springs, Colo. 80904

Filed Jun. 20, 1977, Ser. No. 808,265
Int. Cl.[2] B60P *1/04*; B62B *1/14*
U.S. Cl. 414—490 **1 Claim**



1. A hand truck for lifting and carrying penetratable objects comprising,

a frame including a pair of parallel spaced apart, upright, rigid, tubular members having upper and lower portions and whose upper portions are disposed at an angle to the lower portions and outwardly from each other at a divergent angle;

a pair of ground engaging wheels;

axle means attached to the lower portion of the said frame and mounting said wheels for rotation;

a stabilizing platform rigidly connected to the lower portion of the frame, said platform disposed tangentally to the periphery of the said wheels;

web means interconnecting the upright tubular members;

a straight tubular housing attached to the said web means intermediate the said tubular member and parallel therewith;

a mast slidably disposed in the tubular housing;

jacking means, including a pivotal handle, interconnecting the tubular housing and the slidable mast;

spike means connected to the top of the mast and projecting forwardly therefrom and over the said platform; and

a handle attached to the spike means and projecting rearwardly therefrom.

4,181,464

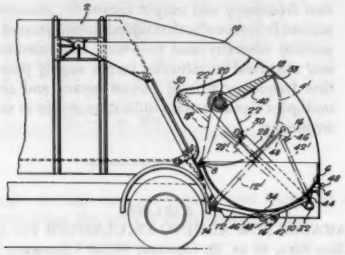
REFUSE VEHICLE LOADING APPARATUS

Thomas W. Tillson, Knebworth, England, assignor to Shelvoke and Drewry Limited, Letchworth, England

Filed Dec. 27, 1977, Ser. No. 865,005
Int. Cl.[2] B65F *3/00*
U.S. Cl. 414—501 **5 Claims**

1. A refuse collection vehicle of the type having a refuse loading apparatus connected to said vehicle, said loading apparatus comprising a hopper and packing means, said hopper being pivotally mounted to pivot between a first position in which refuse may be loaded into the hopper and a second position in which the refuse may be transferred to a storage chamber within the body of the vehicle by said packing means, said hopper having a curved base formed in the shape of a partial cylinder about an axis, said base extending upwardly both forward and rearward from the lowest point of the hopper when the hopper is at its first position so that refuse is retained in the curved base, said packing means including a pivotally mounted scoop adapted to pivot about an axis and to

move from one end of said hopper to the other to push the refuse from the hopper into the storage chamber, the arrangement being such that, when said hopper is moved to its second position, the axis of the cylindrical shaped hopper base is coincident with the pivot axis of said scoop and an outer, free edge of said scoop is located at the rear edge of said curved hopper



base, said scoop having a length from its pivot axis to its outer, free edge substantially equal to the radius of said cylindrical shaped base, said packing means having a discharge stroke which causes the outer, free edge of said scoop to move in a path substantially coincident with the surface of the curved hopper base to sweep the refuse from the hopper.

4,181,465

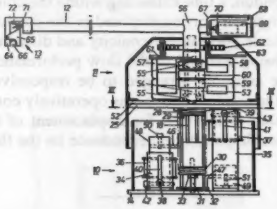
APPARATUS UTILIZING MAGNETIC MEANS FOR TRANSFERRING ARTICLES TO AND FROM PREDETERMINED POSITIONS

Göran A. H. Ridderström, Taby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 732,714, Oct. 15, 1976, abandoned, which is a continuation of Ser. No. 549,740, Feb. 13, 1975, abandoned. This application Apr. 25, 1978, Ser. No. 899,823

Int. Cl.[2] B65G *47/90*

U.S. Cl. 414—590 **6 Claims**



1. Robot apparatus for transferring articles to and from predetermined positions comprising a base member, two transfer mechanisms which are supported by said base member, said transfer mechanisms each comprising a movable member and drive means operatively connected to said movable member whereby movement of each of the movable members is in one direction and in an opposite direction in a substantially linear path about a neutral position located between two end positions, one of said movable members having an arm provided with a gripping member for gripping and holding an article during transfer and moving the same about a plane parallel to the plane of said base member, said transfer mechanisms coacting to selectively move said gripping member between predetermined positions, and each transfer mechanism having means to provide limited motion and hold the movable member in either end position, and said drive means including a spring acting as a main energy source for said movable member, and said limited motion means forcing said movable member a distance corresponding to the energy losses occurring in said apparatus.

4,181,466

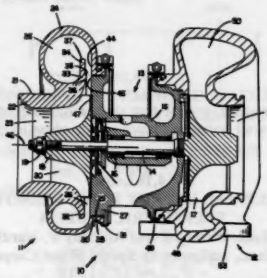
CENTRIFUGAL COMPRESSOR AND COVER

Bruce R. Owen, Indianapolis, Ind., assignor to Wallace Murray Corp., Indianapolis, Ind.

Filed Mar. 17, 1977, Ser. No. 778,372

Int. Cl.[2] F01D *25/24*

U.S. Cl. 415—204 **6 Claims**



1. A centrifugal compressor suitable for use with an internal combustion engine which comprises:

a bearing housing;

an impeller including a back and having a central axis, said impeller having a maximum radial dimension;

means for rotatably mounting said impeller to said bearing housing, said bearing housing including a mounting portion extending adjacent the back of said impeller and radially outward beyond said impeller; and

an integral compressor cover having a wall portion defining an impeller chamber and a scroll defining a generally toroidal outlet passageway surrounding the impeller chamber, the wall portion including an internal surface surrounding a portion of said impeller and being machined to conform to the surrounded portion of said impeller, said cover having a mount portion including a pilot surface adjacent and connected to the mounting portion of said bearing housing, said cover further having a diffuser portion spaced apart from the mount portion of said cover and from the mounting portion of the bearing housing, the diffuser portion together with the mount portion of the cover and the mounting portion of the bearing housing defining an annular, diffuser passageway in communication with the outlet passageway, the diffuser portion extending radially from the central axis of said impeller and extending both inward and outward of the pilot surface and at least a part of the diffuser portion having a maximum radial extent from the central axis at least as great as one and one-half times the maximum radial dimension of said impeller, the diffuser portion includng a machined surface only radially inward from the pilot surface, the diffuser passageway decreasing in axial width only in the direction of the central axis of said impeller.

4,181,467

RADIALLY CURVED AXIAL CROSS-SECTIONS OF TIPS AND SIDES OF DIFFUSER VANES

Kenneth Campbell, Ridgewood, N.J., assignor to Miriam N. Campbell, Oradell, N.J.

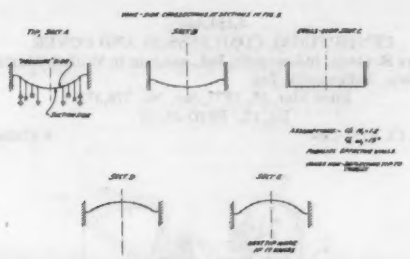
Filed Jan. 31, 1979, Ser. No. 8,151

Int. Cl.[2] F01D *1/02, 9/00*

U.S. Cl. 415—207 **5 Claims**

1. A vaned diffuser for centrifugal compressors comprising multiple vanes, each vane having an upstream tip and the axial cross section of said tip being a straight line when viewed from

a radial direction, and wherein also said tip lies on a curve in a radial plane which is convex radially inwardly and concave



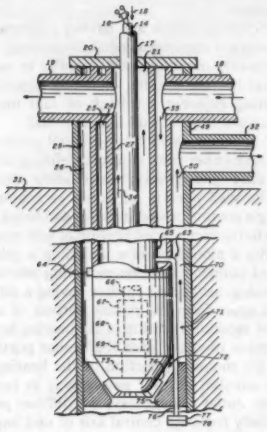
radially outwardly, except that said radial vurvature need not apply in the wall boundary layer region close to the side-walls.

4,181,468

GEOTHERMAL ENERGY PUMP MONITOR AND TELEMETRIC SYSTEM

William H. Kent, Westford, and Anthony P. Nardi, Burlington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,794
Int. Cl.[2] F04B *17/06, 21/00*
U.S. Cl. 417—63 **25 Claims**



1. In geothermal deep well pumping apparatus located at a subterranean source of geothermal well fluid of the kind including geothermal energy exchange means for providing a working fluid and bearing-supported pump means driven by motor means responsive to said working fluid for pumping said geothermal fluid for flow in cooperative energy exchange relation with respect to said geothermal exchange means toward the earth's surface:

electrical transformer means having separable first and second inductive portions normally disposed in cooperative energy exchanging relation,

conduit means extending from the earth's surface for supporting said first inductive portion,

said conduit means protectively enclosing a two-wire transmission line coupled to said first inductive portion,

power generator means operating at a first frequency and coupled to said two-wire transmission line,

utilization means responsive to signals of a second frequency additionally coupled to said two-wire transmission line,

at least first and second sensor means responsive to respective predetermined first and second characteristics of said geothermal well fluid,

circuit means responsive to said first and second sensor means for generating multiplexed signals representative of said first and second characteristics at said second frequency,

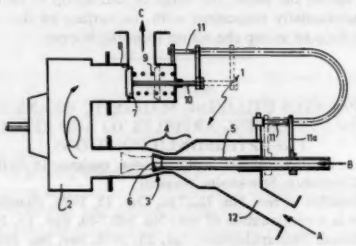
said circuit means having input means for receiving said first frequency and output means for transmitting said second frequency both coupled to said second inductive portion whereby said two-wire transmission line and said electrical transformer means supply power at said first frequency to said circuit means and supply said multiplex signals to said utilization means at said second frequency.

4,181,469

APPARATUS FOR ADDING EMULSIFIER TO A FLUID

Guy Dion-Biro, 46 av. du Chateau, 94300 Vincennes, France

Filed Jan. 30, 1978, Ser. No. 873,492
Claims priority, application France, Jan. 28, 1977, 77 02379
Int. Cl.[2] F04B *23/14*
U.S. Cl. 417—87 **10 Claims**



1. Apparatus for adding emulsifier to a flowing fluid, comprising a conduit for carrying said fluid, a nozzle restriction portion in the conduit, a tube extending within the conduit and having a discharge end portion disposed in the conduit in the region of the nozzle portion, the conicity and diameter of the nozzle portion being adapted to the flow performance in the conduit, a valve assembly arranged to be responsive to the flow of fluid in the conduit, and means operatively connecting the valve assembly to the tube for displacement of the tube relative to the nozzle portion in dependence on the fluid flow in the conduit.

4,181,470

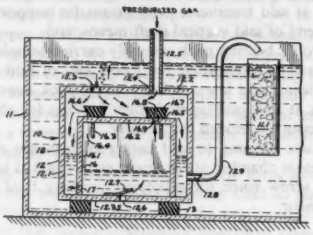
GAS-OPERATED LIQUID PUMP

Bruce F. Gillett, Rte. 1, Box 44, Marine-on-St. Croix, Minn. 55047

Filed Nov. 18, 1977, Ser. No. 852,935
Int. Cl.[2] F04F *1/06*
U.S. Cl. 417—131 **7 Claims**

1. A gas-operated pump for pumping a liquid comprising an outer compartment; an inner compartment vertically moveable between upper and lower positions in the outer compartment and having positive buoyancy in the liquid to be pumped and having a gas exhaust port disposed therethrough; inlet and exhaust porting means for permitting entry and discharge of gas and liquid to and from the pump; and valve means operable, when the inner compartment is in its upper position, to restrain loss of gas from the inner compartment through the gas exhaust port while simultaneously allowing gas to enter said inner compartment through said gas exhaust port causing

displacement of liquid therefrom to thereby pump the liquid out through said exhaust porting means, and further permitting



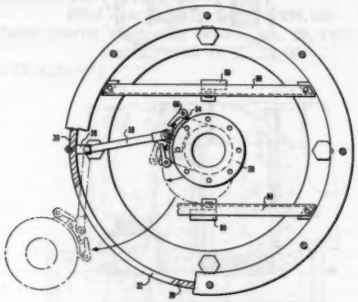
gas to escape through said gas exhaust port from said inner compartment when the latter is in its lower position.

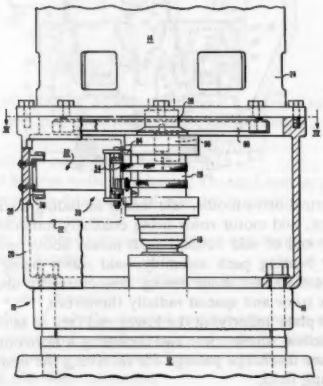
4,181,471

NUCLEAR REACTOR COOLANT PUMP HAVING A TOOLING BOOM

Luciano Veronesi, O'Hara Township, Allegheny County, and Woodie R. Francis, Penn Township, Berks County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,191
Int. Cl.² F04B 17/00
U.S. Cl. 417—360 **6 Claims**





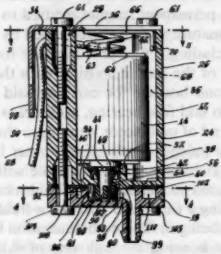
1. A vertical pump having a tooling boom comprising:
a pump having a vertical pump shaft;
a motor stand having openings therein and mounted on said pump;
a motor having a vertical drive shaft and mounted on said motor stand with said drive shaft being coupled to said pump shaft, said motor driving said pump by means of said drive shaft and said pump shaft; and
an articulated arm having a first end attached to said motor stand and having a second end capable of being extended near said pump shaft with a gripping mechanism attached to said second end for grasping components of said pump and transferring said components through one of said openings in said motor stand.

4,181,472

LIQUID DISPENSING WINDSHIELD WASHER PUMP

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Dec. 12, 1977, Ser. No. 859,875
Int. Cl.² F04B 17/00
U.S. Cl. 417—363 **12 Claims**

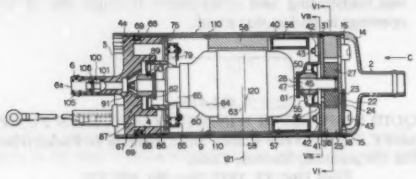


1. In a positive-pressure liquid dispensing pump of the motor driven vane type that includes
a housing defining a motor chamber having a motor supporting end wall,
a closure wall fixed to said end wall,
an impeller chamber defined between said walls,
an impeller rotatable in and having vanes bearing against a peripheral surface of said impeller chamber,
an electrical motor supported in said motor chamber and having a rotary shaft extending through an opening in said end wall for driving said impeller, and
inlet and outlet passages respectively for conducting fluid into and from said impeller chamber;
improvements which comprise:
the improvement wherein said impeller chamber is constituted by confronting recesses formed respectively in said closure wall and said end wall, said recesses being bordered circumferentially by respective portions of said walls that have confronting surfaces meeting at a tight interface about said peripheral surface,
the improvement wherein each of said passages comprises a channel, extending substantially radially of said impeller chamber, formed in said portion of said closure wall and covered by said portion of said end wall; and
a sealing gasket compressed between surfaces of said walls peripherally of said interface and constituting a portion of a side surface of each of said passages,
whereby said peripheral surface of said impeller chamber is evenly constituted so that said impeller vanes effect positive-pressure pumping action by bearing thereagainst, and
whereby said passages do not extend through said sealing gasket and deformation of said sealing gasket does not obstruct said passages.

4,181,473
MOTOR PUMP

Yoshifumi Ina, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 1, 1977, Ser. No. 802,532
Claims priority, application Japan, Jul. 1, 1976, 51-78567; Jul. 1, 1976, 51-78568
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—365 4 Claims



1. A motor pump comprising:

a motor unit including an outer housing and a cup-shaped ferromagnetic motor housing with a bottom having a first bearing, a permanent magnet secured to said motor housing, an armature with a shaft carried by said bearing and meams including a first port member for communicating the inside of the motor housing with the outside thereof and a second bearing for carrying said shaft at the side opposite to said first bearing, said means being secured to the open end of said motor housing so that said motor unit is operable independently of said outer housing,

a pump unit including a rotor rotatable with said shaft and a stator secured to the bottom of said motor housing, said stator having a fluid inlet port and a fluid outlet port, said pump unit being in fluid communication with the inside of said motor housing through one of said fluid inlet and outlet ports; and

said outer housing encasing said motor unit and pump unit and including a second port member formed integral therewith to communicate the other of said fluid inlet and outlet ports with the outside whereby said first port member, the inside of said motor housing, said pump unit and said second port member are in series fluid communication.

4,181,474
VERTICAL AXIS HERMETIC ROTARY HELICAL SCREW COMPRESSOR WITH IMPROVED ROTARY BEARINGS AND OIL MANAGEMENT

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Mar. 2, 1978, Ser. No. 882,728
Int. Cl.[2] F01C 1/16, 21/06
U.S. Cl. 417—366 21 Claims

1. A vertical axis hermetic rotary helical screw compressor comprising:

a closed vertical, cylindrical outer enclosure,

an inner cylindrical casing of a diameter less than that of the outer enclosure,

means for concentrically, fixedly mounting said inner cylindrical casing within said outer enclosure,

said inner cylindrical casing including transverse wall means separating said cylindrical casing into upper and lower chambers,

rotor means including intermeshed helical screw rotors,

vertical shaft means for at least one of said helical screw rotors and coaxially fixed to said at least one helical screw rotor intermediate of the ends of said vertical shaft means,

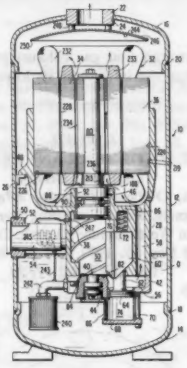
a casing end plate fixed to the lower end of said inner cylindrical casing,

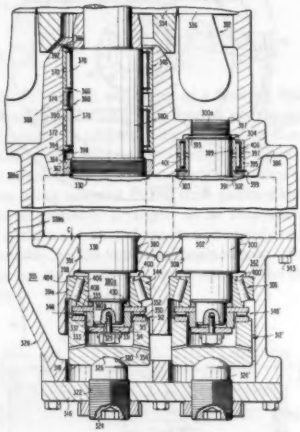
a vertical bore means formed within said casing for mounting said at least one helical screw rotor and partially forming therewith a compressor working chamber,

an upper roller bearing pack assembly carried by said casing means at said transverse wall means for supporting the upper end of said vertical shaft means, and

a lower roller bearing pack assembly carried by said casing end plate for supporting the lower end of said vertical shaft means, said lower roller bearing pack assembly including at least one tapered roller bearing for absorbing compressor developed thrust force,

an inlet tube opening to said casing bore means and said compressor chamber at the upper end of said at least one helical screw rotor for supplying working fluid to said compressor,





an electrical drive motor, said motor including a stator and a rotor, said motor rotor being coaxially mounted to the upper end of said vertical shaft means above said upper roller bearing pack assembly, said stator being fixedly mounted to said inner casing, concentrically about said motor rotor and spaced radially therefrom,

said end plate underlying the lower end face of said at least one helical screw rotor and including a horizontal compresssor discharge passage for receiving the compressed working fluid,

said casing further comprising a vertical compressor discharge passage means extending from said casing end plate to said transverse wall means and opening to the upper chamber housing said drive motor at one end and

said horizontal compressor discharge passage at the other end,

an axial gas discharge outlet within the top of said vertical cylindrical outer enclosure,

the upper end face of said at least one helical screw rotor being open to the upper roller bearing pack assembly,

seal means carried by said upper roller bearing pack assembly for sealing said upper chamber from said at least one helical screw rotor upper end face, said seal means including a rotatable seal element fixed to said shaft means and rotatable therewith, and

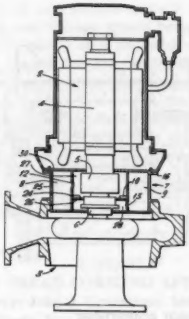
passage means carried by said electric drive motor for permitting said compressed working fluid to pass into said cylindrical outer enclosure at the upper end of said motor, such that during compressor operation, compressor discharge pressure acting on the upper end of said shaft means and on said at least one rotatable seal element and the weight of said motor rotor and said screw rotor partially balances the developed thrust forces acting on said at least one helical screw rotor, while said upper and lower roller bearing pack assemblies absorb the remaining developed thrust force and any radial force acting on said shaft means.

4,181,475

OIL HOUSING

Torvald F. Ståhl, Alvsjo, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,208
Claims priority, application Sweden, Apr. 29, 1977, 7704995
Int. Cl.² F04B *39/02, 37/06*
U.S. Cl. 417—372 **2 Claims**



1. An oil housing arranged between a driving unit and a pumping unit in a submersible pump, said oil housing comprising:

a cylindrical outer wall;

top and bottom walls each having a central aperture adapted to receive a drive shaft of said driving unit;

a cylindrical inner wall;

an outer chamber between said inner and outer walls and a central chamber;

a wall dividing said central chamber into a bearing chamber and a seal chamber;

a plurality of radially directed partitions between said inner and outer walls, said plurality of radially directed partitions dividing said outer chamber into first, second, and third pluralities of rooms;

means for permitting fluid communication between said first plurality of rooms and said bearing chamber; and

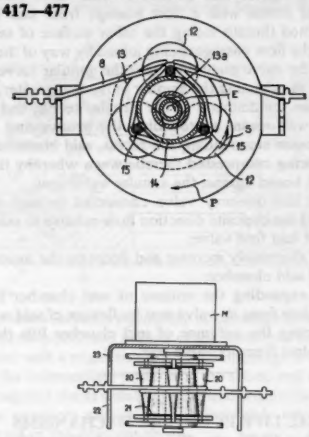
means for permitting fluid communication between said second plurality of rooms and said seal chamber.

4,181,476

PERISTALTIC PUMP AND A TUBE FOR SAID PUMP

Edouard Malbec, Logis de Chalonne, Le Gond Pontouvre, France (16160)

Filed Sep. 19, 1977, Ser. No. 834,544
Int. Cl.² F04B *43/12, 45/08*
U.S. Cl. 417—477 **4 Claims**



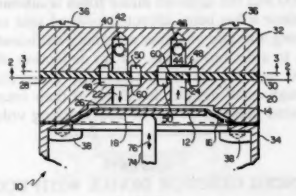
1. A peristaltic pump comprising a drive shaft, a rotor around said shaft including planet-wheels and a planet wheel carrier, each one of said planet-wheels comprising two wheels and a central shaft connecting the latter and being of less diameter than said wheels, said planet-wheel carrier including two axially spaced flanges having radial recesses wherein said central shafts are respectively mounted with radial freedom, a flexible tube forming a pump body being passed around said central shafts of the planet wheels in at least one complete turn and having suction and discharge ends approximately opposite to each other, said flexible tube maintaining said wheels in contact with said drive shaft, and a ring being freely mounted internally of said central shafts of the planet-wheels and between said flanges of the planet-wheel carrier, said ring forming a rolling support for the flexible tube within each interval between the central shafts of said planet-wheels.

4,181,477

PUMP VALVE

Kenneth C. Litt, Silver Spring, Md., assignor to Pace Incorporated, Silver Spring, Md.

Filed Mar. 2, 1978, Ser. No. 882,799
Int. Cl.² F04B *21/02*
U.S. Cl. 417—560 **2 Claims**



1. A pump including:

a variable internal volume chamber for temporary storge of a flow media therein;

a first valve connected to said chamber for one-way flow of said media, therethrough, said valve comprising an elastomer valve sheet having a valve plate therein centered in

arcuate cutouts through the valve sheet with cutout gaps spacing apart the valve plate from the balance of the valve sheet and with opposed flexible webs formed between cutouts connecting valve plate to valve sheet;

an annular valve seat with a flow passage centrally thereof pressing against one surface of said valve plate and a circular recess with a flow passage from said chamber connected thereto facing the other surface of said valve plate, the flow passages being joined by way of the cutouts when the valve plate lifts from the annular valve seat;

a groove surrounding the annular valve seat greater in diameter than the diameter of the circular recess; and

housing wall means surrounding the groove and housing wall means surrounding the recess, said elastomer valve sheet being compressed therebetween whereby the valve plate is biased against the annular valve seat.

a second like one-way valve connected to said chamber oriented for opposite direction flow relative to said chamber and said first valve;

means to alternately increase and decrease the internal volume of said chamber;

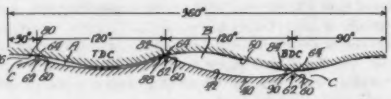
whereby expanding the volume of said chamber lifts one valve plate from its valve seat by flexure of said web, and contracting the volumne of said chamber lifts the other valve plate from its valve seat.

4,181,478

SEAL LIFE IN ROTARY MECHANISMS

John R. Weber, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 13, 1978, Ser. No. 886,231
Int. Cl.[2] F04C *27/00*
U.S. Cl. 418—51 **4 Claims**



1. A rotary mechanism comprising:

a housing defining an operating chamber having at least one wall provided with n major lobes where n is an integer of 1 or more;

a shaft journalled by said housing and including an eccentric within said chamber; and

a rotor within said chamber and journalled on said eccentric, said rotor having at least one surface provided with n+1 equally angularly spaced noses or apexes for sealingly engaging said wall and defining, with said wall, n+1 working volumes;

said wall further being provided with n+1 equally angularly spaced minor lobes located to both sides of said major lobe(s) such that the angular spacing between said major lobe(s) and the adjacent minor lobes is substantially equal;

said minor lobes being directed toward said rotor and extending into said chamber a distance sufficient to compensate, to a desired degree, for (a) deflection of mechanical parts, and (b) relative movement of mechanical parts through small design clearances at their interface due to elevated pressure in one of said working volumes.

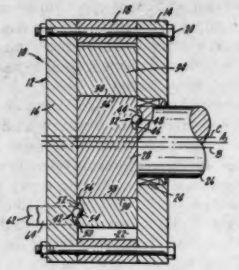
4,181,479

BALANCED GEROTOR DEVICE WITH ECCENTRIC DRIVE

Louis Ross, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1978, Ser. No. 871,285
Int. Cl.[2] F01C *1/02, 21/00, 21/12;* F03C *3/00*
U.S. Cl. 418—61. B **25 Claims**

1. A fluid pressure device comprising a housing, first and second members in said housing for cooperatively defining expanding and contracting fluid chambers, an element supported by said housing for rotation on an axis fixed with respect thereto, first means in said housing establishing an orbital path for said first member about said axis, said first means



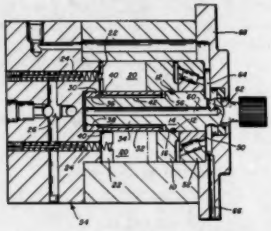
restraining rotational movement of said first member, and second means in said housing establishing an orbital path for said second member about said axis, said second means permitting rotational movement of said second member and rotation of said element on said axis.

4,181,480

ROTARY BLADE HYDRAULIC MOTOR WITH FLUID BEARING

Harold E. Balsiger, 26 W. Third St., Waynesboro, Pa. 17268

Filed Aug. 17, 1977, Ser. No. 825,297
Int. Cl.[2] F01C *1/00, 21/02, 21/04;* F03C *3/00*
U.S. Cl. 418—102 **3 Claims**



1. A hydraulic motor comprising

a cylindrical rotor including a central bore,

a cylindrical stator including selectively advanceable blade means, said stator having a central bore and first conduit means for directing pressurized fluid to said blade means,

a drive shaft extending through said rotor central bore, said drive shaft secured to said rotor,

a conical bearing secured to said drive shaft,

a bearing track,

a cylindrical sleeve member secured within said stator central bore and extending into said rotor central bore and establishing with said rotor central bore a first journal bearing,

said drive shaft at the free end thereof establishing with a corresponding segment of said sleeve, a second journal bearing,

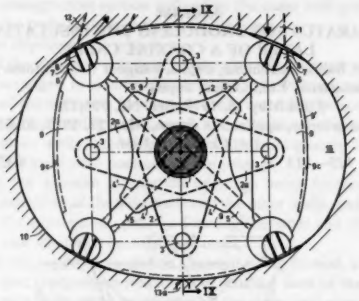
the internal diameter of the remaining segment of said sleeve being enlarged to define with the corresponding segment of said drive shaft an annular fluid cavity,

second conduit means connecting said first conduit means and said cavity.

4,181,481
ROTARY INTERNAL COMBUSTION ENGINE

Alfred Jordan, Drususstrasse 25, 5300 Bonn, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,529
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656751
Int. Cl.[2] F01C *1/00, 19/00, 21/00*
U.S. Cl. 418—253 **8 Claims**



1. In a rotary internal combustion engine, a combination comprising housing means having a chamber defined by internal surface of oval outline; a shaft journalled in said housing means and extending through said chamber coaxially therewith; a plurality of pistons having each a wall portion facing said internal surface and a trailing end adjacent to the leading end of the next-following piston; combined sealing and linkage means interposed between the trailing end of each piston and the leading end of the following piston and articulatedly connecting the ends of said pistons to each other, each of said combined sealing and linkage means being in sealing contact with the respective piston ends and with said internal surface of said housing means; motion-transmitting means between said combined sealing and linkage means and said shaft rigidly connected at inner portions thereof to said shaft and carrying said combined sealing and linkage means movable toward and away from the axis of said shaft; and means serving only to transmit radial forces acting on said pistons to said shaft and comprising arm means turnably mounted on said shaft and pivotally connected at outer ends to said pistons intermediate said combined sealing and linkage means.

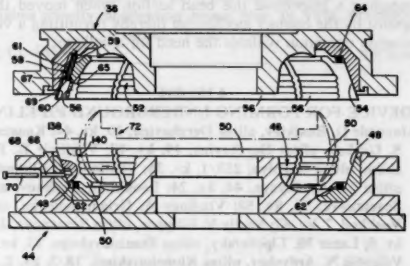
4,181,482
TIRE TREAD FORMING APPARATUS

Charles E. Grawey; John J. Groezinger, both of Peoria, Ill., and Quentin T. Woods, San Jose, Calif., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 791,660, Apr. 28, 1977, Pat. No. 4,152,388, which is a continuation-in-part of Ser. No. 706,712, Jul. 19, 1976, abandoned. This application Jan. 25, 1979, Ser. No. 6,320
Int. Cl.[2] B29H *5/02;* **B29C** *7/00, 17/00;* **B29F** *1/00*
U.S. Cl. 425—28 R **8 Claims**

1. In an apparatus for forming a tread on a green tire carcass, said apparatus including an annular body onto which the uncured elastomer is first deposited, and first and second members movable between a first position at which the members are spaced apart sufficient for positioning the annular body therebetween and a second position at which the members substantially encompass the uncured elastomer on said annular body, each of said members having a plurality of shoes movable between an outward extended position at which the shoes are free from contact with the uncured elastomer on the annular body and an inward retracted position at which the shoes are in contact with the uncured elastomer, the improvement comprising:

means for moving the shoes to an intermediate position between said inward retracted and outward extended positions in response to the members being moved from the second position to the first position, said means includes resilient means for urging the shoes toward the outward extended position and means for selectively limiting movement of the shoes at said intermediate position, wherein the means for selectively limiting movement of

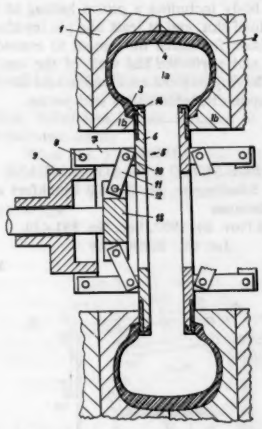


the shoes includes a plurality of openings in the members, a recess positioned in each of the shoes and being in alignment with a respective one of the openings in the members at the intermediate position of the shoes, and a plurality of elongated shafts slidably positioned within the openings in the members and selectively insertable into the mating recess in the adjacent shoe.

4,181,483
APPARATUS FOR THE BELLOWLESS VULCANIZATION OF TIRE BLANKS

Günther Pech, Vienna, and Hans Galleithner, Baden, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 261,305, Jun. 9, 1972, abandoned. This application Jun. 14, 1976, Ser. No. 696,075
Claims priority, application Austria, Jun. 16, 1971, 5208/71; Feb. 10, 1972, 1094/72
Int. Cl.[2] B29H *5/02*
U.S. Cl. 425—36 **4 Claims**



1. An apparatus for the bellowless vulcanization of tire blanks, comprising means forming a tire vulcanization mold including tire bead sections, clamping mechanism for the tire beads provided for said mold, said clamping mechanism comprising the associated bead section of the vulcanization mold and a contact mechanism, means operable from outside said

mold for moving said contact mechanism radially outwardly relative to the center of the mold into confronting relation with the associated bead section and axially toward the associated bead section, said contact mechanism comprising a ring formed of a number of segments, and an integrally-formed ring-shaped member secured to and movable with the segments of said ring, said ring-shaped member including a non-segmented, endless layer of elastomeric material for sealingly engaging a respective tire bead section when moved thereagainst by the contact mechanism thereby permitting a vulcanization operation without the need for a bellows.

4,181,484

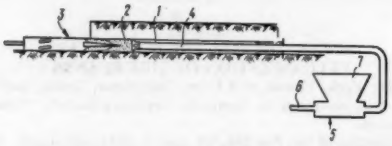
DEVICE FOR FORMING UNDERGROUND PIPELINES

Alexandr D. Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin S. Gurkov, ulitsa Derzhavina, 19, kv. 13; Vladimir D. Plavskikh, ulitsa Gogolya, 233/1, kv. 34; Vladimir V. Klimashko, ulitsa Novogodnyaya, 44, kv. 24; Leonid G. Rozhkov, ulitsa Sovetskaya, 50, kv. 58; Vladimir A. Grigoraschenko, ulitsa Voskhod, 7, kv. 67; Vasily V. Filippov, ulitsa Severnaya, 23/2, kv. 8; Lazar M. Lipovetsky, ulitsa Stanislavskogo, 13, kv. 33; Valentin N. Ardyshev, ulitsa Khmelnitskogo, 18/3, kv. 1, and Khaim B. Tkach, ulitsa Gogolya, 17, kv. 49, all of Novosibirsk, U.S.S.R.

Division of Ser. No. 669,462, Mar. 22, 1976, Pat. No. 4,088,720, which is a continuation of Ser. No. 432,624, Jan. 11, 1974, abandoned. This application Feb. 17, 1978, Ser. No. 879,941

Int. Cl.[2] B28B *21/42*

U.S. Cl. 425—59 **7 Claims**



1. A device for forming a casing in holes in the ground, said device comprising a rod-shaped body adapted for moving through a hole and a system of radial ribs installed on the front end of said body for uniform distribution of mortar material in the hole over the cross-sectional area of the hole, a power cylinder in said body including a piston having at least one longitudinal inclined slot, and at least one pin installed in said body with provision for radial movement to extend radially from said body and perforate the wall of the casing being formed, said pin having one end received in said slot for being radially moved upon displacement of said piston.

4,181,485

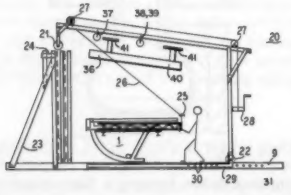
TILTABLE MOLD AND SHED MEANS

Horst Schramm, Schellingstr. 16, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,420

Int. Cl.[2] B28B *7/08*

U.S. Cl. 425—88 **10 Claims**



1. Apparatus for casting plate-like concrete wall elements comprising a casting table, a wide area mold affixed thereto, said casting table being supported by a pair of curved runners, said casting table being stable when said wide area mold is in a horizontal position and rockable upon said pair of curved runners to place said wide area mold in substantially a vertical position, removal means operable to separate said wide area mold from said concrete wall element when said wall element is in the vertical position, said removal means including a member forming the lowest part of said wide area mold when said wide area mold is in a vertical position.

4,181,486

APPARATUS FOR PRODUCING THE INSULATING LAYER OF A COAXIAL CABLE

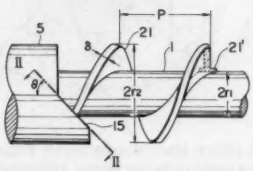
Yasunori Saito, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 15, 1978, Ser. No. 906,173

Claims priority, application Japan, May 17, 1977, 52-57273

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—113 **6 Claims**



1. In an apparatus for forming a spiral rib of an insulating material between the inner and outer conductors of a coaxial cable, said apparatus including a cross head and a rotation nozzle disposed in the cross head and rotated at a predetermined rotational speed about the axis of said inner conductor and having an extrusion slit in an extrusion surface thereof for extruding a spiral rib of molten plastic insulating material onto the inner conductor as the latter runs through said nozzle at a predetermined longitudinal speed, the improvement comprising:

said extrusion surface of said rotation nozzle being inclined with respect to a center axis of the inner conductor so that the extruded spiral rib is carried away from said slit by said inner conductor in in a direction substantially perpendicular to said extruding surface.

4,181,487

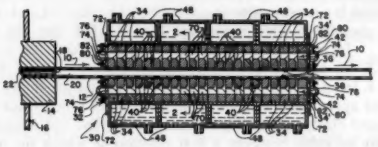
VACUUM SIZING APPARATUS

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed Dec. 23, 1977, Ser. No. 863,886

Int. Cl.[2] B29D *23/00*

U.S. Cl. 425—326.1 **22 Claims**



1. In a vacuum sizing apparatus of the type having:

(a) a structure defining an elongate through passage, the structure being adapted to be positioned downstream from an extruder with the passage extending along a path followed by a deformable body of settable material being extruded substantially continuously from the extruder;

(b) the structure having inner wall portions which define at least a part of the passage and which present a passage cross section unto which outer surface portions of the

extruded body are to be conformed as the body travels through the passage;

(c) the inner wall portions being provided with a plurality of vacuum evacuation openings through which gases may be evacuated from the passage to form a vacuum therein in the vicinities of the inner wall portions for causing outer surface portions of the extruded body to be brought into conforming engagement with the inner wall portions to thereby conform outer surface portions of the body to the passage cross section defined by the inner wall portions as the body travels through the passage;

the improvement wherein:

(a) the structure comprises a plurality of structural segments arranged in side-by-side relationship, with adjacent ones of the segments having side walls extending in surface-to-surface mating engagement, and with the segments having inner walls extending substantially contigiously to define the inner wall portions of the passage;

(b) the vacuum evacuation openings being located at the junctures of the side walls and the inner walls, and each of the evacuation openings forming the inner end of a separate vacuum evacuation channel;

(c) the vacuum evacuation channels being formed, at least in part, by grooves machined in selected ones of the mating side walls of adjacent ones of the structural segments;

(d) conduit means interconnecting the channels and communicating the channels with a vacuum source for evacuating the passage in the vicinities of the regions where the vacuum evacuation channels open through the inner wall portions to bring outer surface portions of the body into conforming engagement with the inner wall portions as the body passes through the passage; and,

(e) clamping means releasably clamping the segments together to form a rigid structure with the inner walls defining smooth and contigiously extending inner wall portions which are imporous except for the vacuum evacuation openings which open through the inner wall portions.

4,181,488

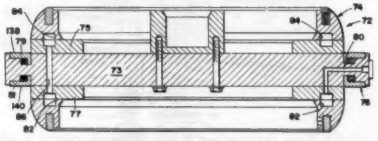
TIRE TREAD FORMING MOLD BODY

Charles E. Grawey; John J. Groezinger, both of Peoria, Ill., and Quentin T. Woods, San Jose, Calif., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 791,660, Apr. 28, 1977, Pat. No. 4,152,388, which is a continuation-in-part of Ser. No. 706,712, Jul. 19, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,115

Int. Cl.[2] B29H *5/02*; B29C *7/00*; B29F *1/00*; B29G *3/00*

U.S. Cl. 425—577 **6 Claims**



1. A mold body on which electromeric material can be positioned for formation of a tread thereon comprising a generally annular main body portion and a continuous rib disposed about the outer periphery of the main body portion including a plurality of poppet valve members movably mounted thereon and movable between retracted positions relative to the main body portion and the extended positions relative to the main body portion; and

mean for selectively extending and retracting the poppet valve members.

4,181,489

PROCESS FOR THE TREATMENT OF BYPRODUCTS OBTAINED IN THE PREPARATION OF PHTHALIC ANHYDRIDE

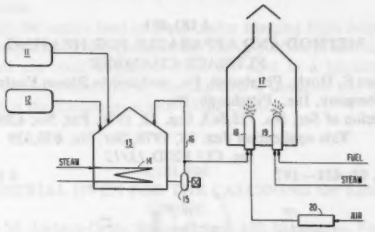
Yoshiaki Toyoda; Yoshiaki Teraji, and Takaai Suzuki, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,766

Claims priority, application Japan, Nov. 24, 1976, 51/140186

Int. Cl.[2] F23D *11/44*

U.S. Cl. 431—11 **8 Claims**



1. A process for the treatment and combustion of byproducts containing some residual phthalic anhydride, obtained in the preparation of phthalic anhydride by the partial oxidation of orthoxylene or naphthalene which consists essentially of the steps of:

(i) heating said byproducts containing some phthalic anhydride to a temperature sufficient to maintain the byproducts in a molten state;

(ii) atomizing the molten byproducts in a combustion zone using atomizing air having a temperature of at least 60° C.; and

(iii) combusting the atomized molten byproducts in the combustion zone with or without the addition of any additional air for combustion purposes, whereby complete combustion of the atomized molten byproducts is achieved, said phthalic anhydride in said byproducts not being removed therefrom at anytime during or between steps (i) to (iii).

4,181,490

DISPOSABLE CIGARET LIGHTER WITH SNUFFING COVER

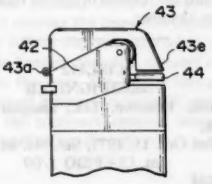
Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Filed Jun. 17, 1977, Ser. No. 807,534

Claims priority, application Japan, Jun. 17, 1976, 51-71548

Int. Cl.[2] F23Q *2/08*

U.S. Cl. 431—129 **10 Claims**



1. A disposable cigaret lighter having a lighter assembly on a reservoir containing a liquefied fuel gas, said lighter assembly including a windbreak wall, a gas outlet nozzle with a valve provided on the reservoir surrounded by said windbreak wall, a nozzle opening lever engaged with the nozzle for opening

said valve to cause the fuel gas to eject out of said nozzle, a sparking wheel, and a flint urged to be in frictional engagement with the sparking wheel, wherein the improvement comprising a snuffing cover mounted on said windbreak wall, said snuffing cover being rotatably mounted on said windbreak wall and movable between a closed position to close the upper opening of the wall and an open position to be retracted from the upper opening of the wall, the operation of said nozzle opening lever and said sparking wheel being independent of the movement of said snuffing cover between said closed position and said open position, and said snuffing cover having a catch to be snap-engaged with the sparking wheel.

4,181,491

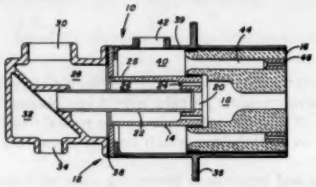
METHOD AND APPARATUS FOR HEATING A FURNACE CHAMBER

James E. Hovis, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 725,563, Sep. 22, 1976, Pat. No. 4,083,677. This application Jan. 18, 1978, Ser. No. 870,329

Int. Cl.² F23D *13/12*

U.S. Cl. 431—187 **6 Claims**



1. A burner and excess air apparatus for use in a heat treating furnace having an inner furnace face comprising:

A. a burner body;

B. a baffle forming a forward wall of the burner body and including a plurality of spaced combustion sustaining gas apertures extending through the wall and positioned in a circular array radially outward from a fuel opening extending coaxially with a burner body central axis;

C. a fuel duct extending coaxially through the burner body and in registry with the fuel opening;

D. a combustion chamber formed downstream of the baffle and in registry with the apertures and fuel opening and the furnace;

E. a combustion sustaining gas chamber within the burner body and upstream of the apertures;

F. fuel inlet means and gas sustaining inlet means communicating with the fuel duct and combustion sustaining gas chamber respectively; and

G. forced excess air means associated with the burners and spaced from the combustion chamber comprising an excess air chamber in registry with at least one air duct exiting at the furnace face for directing high velocity excess air into the furnace in spaced relationship from said combustion chamber.

4,181,492

TORCH IGNITER

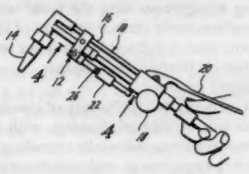
Andrew E. Zinke, Houston, Tex., assignor to Striker, Inc., Houston, Tex.

Filed Oct. 11, 1977, Ser. No. 841,016

Int. Cl.² F23Q *3/00*

U.S. Cl. 431—264 **8 Claims**

1. Apparatus used to ignite gas emitted through a tip of a portable hand held gas burning torch used for cutting, welding soldering or brazing of metals, comprising a piezoelectric generator having an electrode which discharges a spark for igniting the gas being emitted through the tip, said generator having a manually operable plunger for causing said generator to apply an electrical potential to said electrode upon manual operation of said plunger, a single arm supporting said generator, said electrode terminating adjacent one extremity of said arm, pivotal support means for supporting said gas igniting means on said torch and for permitting swinging movement of the electrode from a stored position, where the electrode is positioned away from the tip and the arm lies substantially



parallel to the torch and the electrode is protected by the structure of the torch, to an igniting position, where the electrode is positioned immediately adjacent the tip in the path of gas emerging from said tip so that a spark discharged by activation of said gas igniting means will ignite the gas being emitted from the tip and whereby ignition of said gas is initiated immediately adjacent said tip.

4,181,493

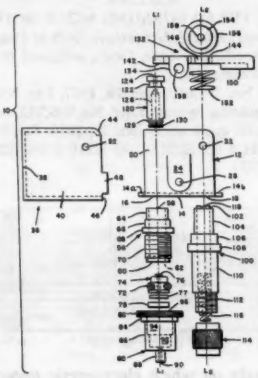
GAS LIGHTER HAVING SLIDABLY DETACHABLE HEAD ASSEMBLY

Rodney S. Piffath, Northridge, Calif., and John J. Cole, New York, N.Y., assignors to International Fire Tool Corp., New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,440

Int. Cl.² F23Q *2/16*

U.S. Cl. 431—344 **21 Claims**



1. A gas lighter comprising:

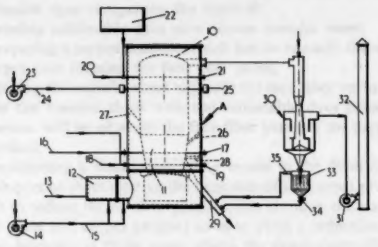
(a) a disposable fuel cartridge containing fuel under pressure and including peripheral sealing means; and

(b) head means slidably attached to and slidably detachable from said disposable fuel cartridge and fluidly coupled through said peripheral sealing means to said fuel and operative to enable valving, regulation and ignition of said fuel.

4,181,494
PROCESS FOR TREATING DRILLING CUTTINGS AND MUD

Ivan E. Kimberley, Stockport, England, assignor to West's Pyro Limited, Stockport, England

Filed Aug. 12, 1977, Ser. No. 824,141
Claims priority, application United Kingdom, Aug. 12, 1976, 33538/76
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—2 4 Claims



1. A process for de-contaminating drilling cuttings contaminated with hydrocarbon oil or oil-based liquid mud employed in drilling operations and contaminated with hydrocarbon oil, comprising the steps of:

(a) providing a fluidised bed of inert particles,

(b) heating the fluidised bed to a predetermined operational temperature to start up the process

(c) delivering hydrocarbon oil-contaminated drilling cuttings down onto the surface of the heated fluidised bed or liquid mud into the heated fluidised bed whereby the hydrocarbon oil burns and contributes to the heat requirements of the process,

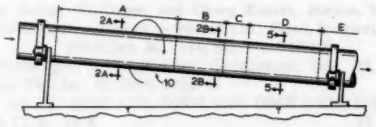
(d) controlling the operational temperature of the process by the addition of fuel to the fluidised bed and a temperature dissipant to both the interior and upper surface of the fluidised bed, and

(e) discharging hydrocarbon-free drilling cuttings or mud solids from the bottom of the fluidised bed.

4,181,495
INTERNAL SUSPENSION PREHEATER FOR LONG ROTARY KILNS

Jorgen O. Bernt, 1357 Amber Crescent, Oakville, Ontario, Canada

Filed Feb. 9, 1978, Ser. No. 876,535
Int. Cl.[2] F27B *7/14*
U.S. Cl. 432—118 4 Claims



3. In a rotary kiln having a cylindrical wall whose inner surface defines a downwardly sloping path for particulate material from an inlet toward a main operational zone, wherein heating gases are caused to flow therethrough in the opposite direction to that of travel of said material,

a lifting zone in said kiln between said inlet end and said main operational zone for causing transfer of particulate material from said bed into such heating gases,

an impingement separator zone located between said inlet end and said lifter zone,

a plurality of chains, in said impingement separator zone suspended by one end at suspension points to hang from said inner wall,

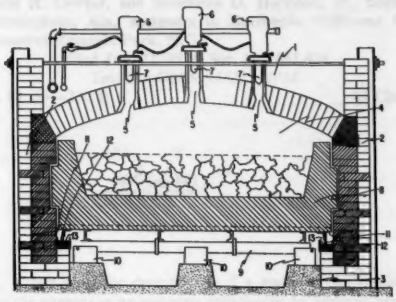
said chain suspension points being arranged about the circumference of said inner wall, said suspension points being spaced

so that the centre lines of these chains hanging from suspension points on the downwardly facing portion of said inner wall are each displaced from the next in a horizontal direction transverse to the kiln axis a distance less than twice the maximum width of the chain.

4,181,496
INDUSTRIAL OVEN FOR THE CALCINING OF LIME STONE

Hector M. Arriaga-Ortiz, Simon Bolivar 150, Monterrey, Nuevo Leon, Mexico

Filed Mar. 2, 1977, Ser. No. 773,770
Int. Cl.[2] F27B *9/26*
U.S. Cl. 432—137 2 Claims



1. An industrial oven for calcining lime stone or the like comprising a base, side walls supportingly connected to the base, a curved roof supported by the side walls, the roof, side walls, and base forming a heating chamber, at least one burner disposed in the upper portion of the heating chamber, a duct cooperatively communicating with the burner, a mouthpiece attached to the duct, the duct and the mouthpiece connecting the burner to the heating chamber, the mouthpiece penetrating into the ducts and carrying combustion heat into the heating chamber, a transport element movably supported upon the base, and means for moving the transport element, said means comprising a set of rollers disposed parallel to each other and transverse along the heating chamber, support elements securingly connected to the base, the rollers being rollably supported and constrained against longitudinal movement by the support elements, the transport element being rollably supported at a lower portion by the rollers.

heating gases are [illegible] through the [illegible] direction to that of the [illegible] ...
[illegible]

INDUSTRIAL [illegible] FOR THE [illegible] OF LIME [illegible]

[illegible]

[illegible]

4,1[illegible]

PROCESS FOR TREATING DRILLING CUTTINGS AND MUD

[illegible], England, assignor to [illegible] Limited, [illegible], England

Filed Aug. [illegible], 197[illegible], Ser. No. [illegible]

Claims priority, application United Kingdom, Aug. [illegible], 1976, [illegible]

Int. Cl.[illegible]

U.S. Cl. [illegible] 4 Claims

1. A process for the decontamination of drilling cuttings contaminated with [illegible] oil or [illegible] during drilling operations and contaminated with hydrocarbon oil, comprising the steps of:

(a) providing a fluidized bed of inert particles;

(b) heating the fluidized bed to a predetermined temperature [illegible] the bed;

(c) [illegible]

(d) [illegible]

(e) [illegible] from the surface of the fluidized bed.

[illegible]

[illegible]

[illegible]

CHEMICAL

4,181,497

PROCESS FOR SHADING DURING THE VAPOR PHASE DYEING OF CARPET

Mervin R. Buckwalter; Walter T. Bulson, and Leonard N. Ray, Jr., all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 10, 1976, Ser. No. 694,763

Int. Cl.[2] D06P *5/20, 7/00*

U.S. Cl. 8—2.5 A **1 Claim**

1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:

(a) printing sublimable dyes on a porous transfer sheet,

(b) preparing a carpet product which has on one side thereof carpet yarn forming the face fiber yarns,

(c) placing the transfer sheet adjacent the face fiber yarns so that the transfer sheet with the sublimable dyes printed thereon will be adjacent the face fiber yarns of the carpet product,

(d) positioning a shade controlling means in the form of a non-porous sheet relative the back side of the carpet product to reduce the air flow permeability through the transfer sheet and carpet product so as to yield a reduction of dye intensity in those areas where the shade controlling means exists, said shade controlling means having a minimum width of $\frac{1}{4}$ inch, and

(e) transferring the sublimable dyes from the transfer sheet to the carpet face yarns by the application of a directional flow, heated gaseous medium, passing through the transfer sheet and the carpet product in the direction from the transfer sheet towards the face fiber yarns with the areas not containing the shade controlling means resulting in full color transfer of dye from the transfer sheet to the face fiber yarns of the carpet product and with those areas containing the shade controlling means there being a reduction in the dye intensity on the face fiber yarns of the carpet product.

4,181,498

DYEING AND PRINTING WITH SYNTHETIC THICKENERS

Paul Koltai, Binningen, and Georg Robert, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sep. 20, 1976, Ser. No. 724,490

Claims priority, application Switzerland, Sep. 23, 1975, 12336/75; Mar. 12, 1976, 3093/76

Int. Cl.[2] D06P *1/39;* **D06M** *3/10;* **D06P** *1/653, 1/673*

U.S. Cl. 8—18 A **19 Claims**

1. In a process wherein a pile or tufted textile fabric is dyed or printed by applying thereto an aqueous dye paste comprising a dyestuff and a synthetic thickener which is sensitive to electrolytes, the improvement which comprises employing such a dye paste which is free from added electrolyte and applying an electrolyte to those portions of the substrate which are to be dyed or printed with said dyestuff, prior to or after application of said dye paste and before fixation of the dyestuff, and causing contact between said electrolyte and said dye paste, whereby there occurs a reduction in the viscosity of said dye paste with resulting improved penetration and dyeing or printing of those portions of the substrate where said contact occurs.

4,181,499

PROCESS FOR THE LEVEL DYEING OF POLYACRYLONITRILE MATERIALS OF SLOW, NORMAL AND RAPID ABSORPTIVE CAPACITY

Joseph Koller, Reinach; Manfred Motter, Dornach; Peter Moser, Binnigen; Ulrich Horn, Basel, all of Switzerland, and Pierre Galafassi, Rixheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 625,730, Oct. 24, 1975, abandoned.

This application Sep. 1, 1977, Ser. No. 829,832

Claims priority, application Switzerland, Oct. 29, 1974, 14465/74

Int. Cl.[2] D06P *1/41, 3/76;* **C09B** *29/38, 19/00*

U.S. Cl. 8—26 **16 Claims**

1. A process for the level trichromic dyeing of polyacrylonitrile material selected from polyacrylonitrile materials of slow, normal and rapid absorptive capacities, comprising the step of applying to the polyacrylonitrile material an aqueous dye liquor containing

(a) at least one each of a red, a blue and a yellow migrating cationic dyestuff which has a cation weight of less than 310, a parachor of less than 750 and log P of less than 3.6; and

(b) 1 to 10% by weight, relative to the weight of the polyacrylonitrile material, of an inorganic electrolyte.

4,181,500

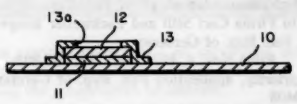
CHEMICAL TESTING SYSTEMS

Donald R. Cowsar, and Steadman D. Harrison, Jr., both of Birmingham, Ala., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jan. 22, 1976, Ser. No. 651,424

Int. Cl.[2] G01N *31/22, 31/16*

U.S. Cl. 23—230 B **23 Claims**



1. A test strip for determining if a material oxidizable by iodine is present in an aqueous solution in an amount greater than a predetermined amount, comprising support material having impregnated therethrough at least a portion of water activatable generator means in solid dry form for generating an effective amount of iodine in situ and color indicator means for indicating the presence of iodine, said means for generating iodine comprises an iodide salt, an iodate salt and an acid, and a source of basic anions in dry solid form for neutralizing protons formed during generation of said iodine.

21. The method of determining if the level of a material oxidizable by iodine in an aqueous test fluid is greater than a predetermined amount which comprises applying said test fluid to a test strip comprising an acid, an acid activatable source of iodine comprising an iodide salt and an iodate salt, a source of basic anions in an amount sufficient to reverse the pH from acid to alkaline after the generation of iodine and iodine indicator all dry solid form, and allowing the fluid to react therewith and thereafter observing the color of the indicator.

4,181,501

METHOD AND APPARATUS FOR MEASURING ANTIBODY LEVELS

Charles R. Keese, Schoharie; Ivar Giaever, and William J. Ward, III, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,695

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **21 Claims**

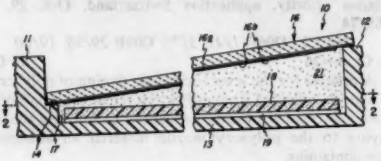
1. Apparatus for determining the presence or absence of

select biological particles in a biological sample and the concentration of said select biological particles, comprising in combination

a solid, rigid substrate member having a layer of the select biological particles adsorbed on a major surface thereof,

a holder comprising a solid, rigid bottom wall,

means for containing liquid having biological particles therein specific to said select biological particles, said containing means extending along said bottom inner surface in a generally longitudinal direction, and



means for supporting said substrate member, said supporting means holding said substrate member adjacent said containing means with at least a portion thereof spaced therefrom and with the layer of select biological particles facing said containing means, the orientation of said substrate member relative to said containing means along a line extending in the general longitudinal direction of said containing means being such that from one end of said containing means to the opposite end thereof there is constantly increasing separation between said substrate member and said containing means.

4,181,502

METHOD OF PRODUCING FORM COKE

Heinrich Weber, Recklinghausen; Horst Dungs, Herne, and Franz Beckmann, Alsdorf, all of Fed. Rep. of Germany, assignors to Firma Carl Still and Eschweiler Bergwerksverein, both of, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 957,702

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749408

Int. Cl.[2] C10L *5/00;* **C21B** *5/00;* **C10B** *53/00*

U.S. Cl. 44—10 C **11 Claims**

1. A method of producing metallurgical form coke, comprising, mixing at least two fine ground coal components together, of which one is a non-caking component containing only little of volatile matter and comprises an oil coke, and the other is a caking bituminous coal, the mixing being carried out at a temperature corresponding approximately to the softening point of the caking coal component, carbonizing and pressing the mixture to form a briquetted form coke, and subsequently, hardening the form coke.

4,181,503

PROCESS FOR ALTERNATELY STEAM REFORMING SULFUR CONTAINING HYDROCARBONS THAT VARY IN OXYGEN CONTENT

Roger R. Lesieur, Enfield; Herbert J. Setzer, Ellington, and James R. Hawkins, Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,301

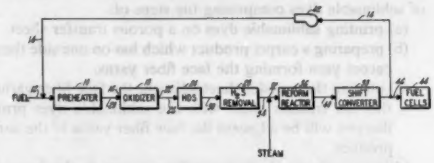
Int. Cl.[2] C10G *13/30;* **C01B** *2/14*

U.S. Cl. 48—196 A **6 Claims**

1. A process for generating hydrogen by steam reforming, alternately, a hydrocarbon fuel containing substantially no oxygen and at least 3 ppm sulfur and a hydrocarbon fuel containing at least 0.5% oxygen by volume and at least 3 ppm sulfur, including the steps of

operating said process on the substantially oxygen free fuel including the steps of mixing said substantially oxygen free fuel with hydrogen, passing said mixture through an oxidizer comprising a bed of supported platinum catalyst whereby said oxidizer catalyst is poisoned by the sulfur in the fuel, reducing the sulfur content of said fuel to less than 0.1 ppm by passing the effluent of the oxidizer through a hydrogen sulfide generator comprising a bed of catalyst which is poisoned by the presence of more than 0.2% by volume oxygen, removing the hydrogen sulfide from the hydrogen sulfide generator effluent, and steam reforming said generator effluent; and then

operating said process on the oxygen and sulfur containing



fuel including the steps of mixing said oxygen and sulfur containing fuel with hydrogen, preheating said mixture to at least the ignition temperature of the oxidizer but to less than 600° F., reducing the oxygen content of said preheated mixture to less than 0.5% by volume by passing it through said oxidizer, reducing the sulfur content of the oxidizer effluent to less than 0.1 ppm by passing it through the hydrogen sulfide generator, removing the hydrogen sulfide from the hydrogen sulfide generator effluent, and steam reforming said generator effluent in a reactor.

4,181,504

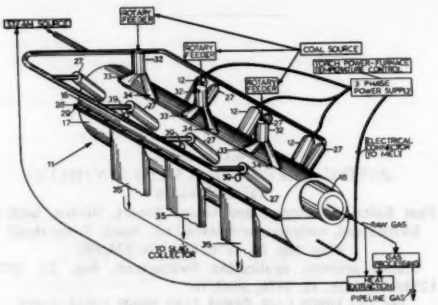
METHOD FOR THE GASIFICATION OF CARBONACEOUS MATTER BY PLASMA ARC PYROLYSIS

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corp., Raleigh, N.C.

Continuation-in-part of Ser. No. 645,413, Dec. 30, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 827,867

Int. Cl.[2] C10J *03/08*

U.S. Cl. 48—197 R **32 Claims**



1. A method for producing fuel gases from particulate carbonaceous matter comprising the steps of:

(a) providing a refractory-lined furnace vessel characterized by the presence of a hearth member containing an electrically conductive refractory material, an unobstructed chamber area positioned immediately above and encompassing said hearth member, substantially air-tight means for continuously introducing said carbonaceous matter at a controlled rate into said furnace from an elevated position therein, means for admitting a carbon combining reactant into said furnace, means for removing product gases and ash residue from said furnace, said wherein said furnace is further characterized by the presence of one or

more electrically powered and gas supplied long arc plasma torches mounted in the walls thereof with the respective arc sustaining ends of each of said torches being directed toward said hearth;

(b) striking an initial plasma arc between each of said plasma torches and said electrically conductive material contained in said hearth member and thereafter supplying sufficient power to said torches to bring the interior chamber area of said furnace vessel to a substantially uniform and stable, preselected temperature of at least 800° C., with said uniformity of temperature being achieved by the radiation of heat from the internal surfaces of said furnace vessel;

(c) continuously introducing a charge of particulate carbonaceous matter into said furnace from an elevated position therein and in a manner such as to substantially preclude atmospheric air from entering the interior of said furnace, the rate of said introduction being correlated with and dependent upon said furnace chamber temperature, said particulate carbonaceous matter charge being characterized by a substantially uniform fixed carbon content and having a particle size of less than about ¾ inch;

(d) permitting said carbonaceous matter to fall by gravity over a predetermined distance from said elevated position to the surface of said electrically conductive material contained in said hearth member, wherein during the course of said fall the carbonaceous matter is devolatilized and the volatiles so obtained are thermally cracked to produce short chain hydrocarbons;

(e) allowing the devolatilized carbonaceous matter to continuously deposit as char on the surface of said conductive material in a single level, non-tiered array at a selected number of gasification sites, the quantity and configuration of said char deposits being controlled such that the unoccupied volume and free surface area of said furnace are maintained in substantial excess over that of the combined volume and surface area of said deposits;

(f) simultaneously with the introduction of said carbonaceous matter introducing substantially stoichiometric quantities of a carbon combining reactant into said furnace vessel for reaction with the fixed carbon of said char deposits to produce fuel gases therefrom, wherein said carbon combining reactant is selected from the group consisting of hydrogen, ammonia and water, with said water being introduced in the form of steam or as a liquid;

(g) monitoring the interior temperature of said furnace vessel and varying the power supplied to said plasma torches during temperature fluctuations therein to maintain the temperature at said preselected level;

(h) continuously withdrawing the gaseous products produced in said furnace; and

(i) removing accumulated residual ash from the hearth of said furnace in a continuous manner or at selected intervals.

4,181,505

METHOD FOR THE WORK-HARDENING OF DIAMONDS AND PRODUCT THEREOF

Robert C. De Vries, Burnt Hills; Francis P. Bundy, Alplaus, and Robert H. Wentorf, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 474,719, May 30, 1974, abandoned. This application Apr. 17, 1978, Ser. No. 896,931

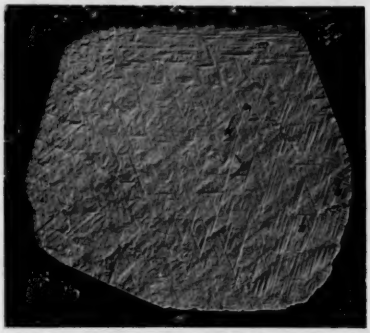
Int. Cl.[2] B24D *3/02*

U.S. Cl. 51—307 **11 Claims**

1. A method of producing a free discrete work-hardened diamond crystal consisting essentially of the steps of:

(a) filling an enclosure with a charge consisting of free discrete diamond crystals wherein the largest linear dimension ranges in size from about 5 to 500 micrometers, said charge with said diamond crystals in direct contact with each other filling said enclosure so that each said crystal provides the requisite support for adjacent crystals for application of pressure thereon sufficiently uniform to substantially inhibit brittle fracture of said diamond crystals,

(b) subjecting said enclosure and said charge to the simultaneous application of pressure and temperature conditions located in the Region of Plastic Deformation as defined in the carbon phase diagram of FIG. 1 wherein the pressure ranges from 5 kilobars to 70 kilobars and the temperature ranges from 900° C. to 1800° C. for a period of time ranging from about one minute to 30 minutes whereby at least one face of at least one diamond crystal is work-hardened but whereby no significant crystal-to-crystal bonding of diamond is produced, said work-hardened face, when polished, showing a plurality of straight bands elevated from said polished face, said straight bands being a manifestation of strain-hardened lamellae extending into the crystal and being composed of discrete work-hardened crystalline material, said work-hardened face having an abrasion resistance higher than that of a non-work-hardened face of said crystal, said charge of free discrete



diamond crystals undergoing no significant bonding to each other,

(c) reducing the temperature to ambient,

(d) reducing the pressure to atmospheric pressure, and

(e) recovering the resulting free discrete work-hardened diamond crystal, said recovered work-hardened diamond crystal being at least significantly fracture-free.

9. A free discrete diamond crystal which ranges in size from about 5 micrometers to about 5000 micrometers, said crystal being at least significantly fracture-free and having at least one work-hardened face with an abrasion resistance higher than that of a non-work-hardened face of said free crystal, said work-hardened face, when polished, displaying a plurality of straight bands elevated from said polished work-hardened face, said straight bands being a manifestation of strain-hardened lamellae extending into said crystal and being composed of discrete work-hardened crystalline material, said free discrete diamond crystal being produced by the method of claim 1.

4,181,506

METHOD FOR RECOVERING CONCENTRATED SULPHUR DIOXIDE FROM WASTE GASES CONTAINING SULPHUR DIOXIDE

Sune Bengtsson, Vllxjö, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 6, 1978, Ser. No. 894,043

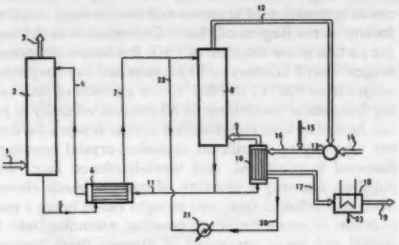
Claims priority, application Sweden, Apr. 12, 1977, 7704193

Int. Cl.[2] B01D *53/14*

U.S. Cl. 55—48 **9 Claims**

1. A method of recovering the concentrated sulphur dioxide from waste gases containing SO_2, by treating the gas with water or aqueous solutions of substances binding sulphur dioxide in an absorption device, characterized by the steps of feed-

ing the solution rich in absorbed SO_2 into a column still and distilling it with steam, compressing the steam-SO_2 mixture



discharged from the still, and at least partially condensing the steam in a heat exchanger re-boiler where steam ingoing to the still is generated.

4,181,507

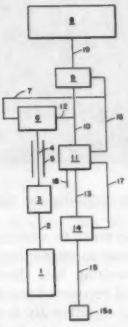
PROCESS FOR TREATMENT OF RESIDUAL GAS

Kurt Nolden, Essen, Fed. Rep. of Germany, assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 12, 1979, Ser. No. 3,042

Int. Cl.[2] B01D *19/00*

U.S. Cl. 55—73 **5 Claims**



1. A process for treating the residual gas, containing sulfur and sulfur compounds, which is produced when hydrogen sulfide is reduced by incineration to elementary sulfur by the Claus process, comprising:

(a) conducting said residual gas from a Claus furnace to a gas scrubbing means while simultaneously maintaining said residual gas at a temperature above the melting point of sulfur;

(b) scrubbing said residual gas within said gas scrubbing means, utilizing liquid flushing liquor as the scrubbing medium, whereby a portion of said sulfur and said sulfur compounds condense and combine with said flushing liquor;

(c) simultaneously conducting said residual gas and said flushing liquor combined with said portion of said sulfur and said sulfur compounds rapidly from said gas scrubbing means to the downcomer of a coke oven battery;

(d) intimately combining within said downcomer said residual gas with raw coke oven gas, as generated by a plurality of coke ovens, prior to removing the tar from said raw coke oven gas;

(e) conducting said combination of residual gas and raw coke oven gas, along with said flushing liquor from said gas scrubbing means, to flushing liquor separator means;

(f) separating, within said flushing liquor separator means, said tar, from said flushing liquor from said gas scrubbing means, and the formed aqueous condensate from said raw coke oven gas, by decanting, said separated tar combining with and containing said portion of said sulfur and said sulfur compounds within said flushing liquor separator means, stripping said residual gas of said portion of said sulfur and said sulfur compounds;

(g) conducting said separated flushing liquor to the main of said coke oven battery via a conduit means; said conduit means including a tributary forming a fluid connection between said conduit means and said gas scrubbing means;

(h) conducting a portion of said flushing liquor from said conduit means through said tributary to said gas scrubbing means, said portion of said flushing liquor to be utilized as said scrubbing medium by said gas scrubbing means;

(i) withdrawing said tar, enriched with said portion of said sulfur and said sulfur compounds, from said flushing liquor separator means;

(j) conducting said stripped residual gas and said raw coke oven gas from said flushing liquor separator means to a primary cooler means;

(k) cooling said stripped residual gas and said raw coke oven gas within said primary cooler means, condensing substantially all of the remaining aqueous components of said raw coke oven gas into liquid form and condensing substantially all of the remaining sulfur and sulfur compounds within said residual gas, and combining said remaining sulfur and sulfur compounds with said condensed aqueous components of said raw coke oven gas;

(l) conducting said condensed aqueous components of said raw coke oven gas combined with said remaining sulfur and sulfur compounds from said primary cooler means to said flushing liquor separator means wherein said condensed aqueous components of said raw coke oven gas combined with said remaining sulfur and sulfur compounds are added to said flushing liquor within said flushing liquor separator prior to said flushing liquor having said tar separated therefrom;

(m) treating said condensed aqueous components of said raw coke oven combined with said remaining sulfur and sulfur compounds, as conducted from said primary cooler means to said flushing liquor separator means and added to said flushing liquor, as described in elements (f), (g) and (h) hereinbefore; and

(n) conducting said stripped residual gas and raw coke oven gas, absent substantially all of the said remaining aqueous components of said raw coke oven gas and absent substantially all of said remaining sulfur and sulfur compounds, to downstream conventional coke oven gas by-product processing facilities.

4,181,508

METHOD AND APPARATUS FOR SEPARATING DESUBLIMATABLE COMPONENTS FROM GAS MIXTURES

Jürgen Schmid, Stutensee-Friedrichstal; Rolf Schütte, Karlsruhe, and Harald Steinhaus, Eggenstein, all of Fed. Rep. of Germany, assignors to Gesellschaft für Kernforschung m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,193

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654249

Int. Cl.[2] B01D *59/08*

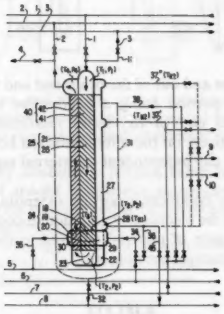
U.S. Cl. 55—82 **39 Claims**

1. Method for separating a desublimatable component from a raw gas mixture containing a non-condensable gas onto the surface of a heat exchanger apparatus having a heat exchanger separator containing a separator passage, said separator having a cold end and a warmer end, comprising: creating a desired starting temperature profile in the heat exchanger separator, flowing the gas mixture through the separator from the warmer end toward the cold end to produce a desired layer thickness profile of desublimate on the surface in the heat exchanger separator in a direction opposite the direction of

flow of the gas mixture by providing a nonstationary temperature distribution profile in the heat exchanger separator to shift the position of the dew point at a controlled speed from a given point near or at the cold end of the heat exchanger separator at the beginning of the separation process to the warmer end of the separator and thereby build up the desired layer thickness profile and charge the separator with the desublimate, controlling changes in the nonstationary temperature profile and thereby controlling the displacement speed of the dew point along the surface of the separator by supplying additional cooling energy to the separator, the additional cooling energy being regulated in time and regulated to produce a constant final temperature in the separator to achieve a desired purity for the non-condensable gas or to achieve a desired degree of separation of the desublimate, terminating the flow of the gas mixture into the separator after full charging of the separator, then evacuating any remaining non-condensable gas in the separator, and thereafter recovering the desublimate by heating up the separator and exhausting the desublimate.

30. Apparatus for separating a desublimatable component from a gas mixture containing an inert gas in a countercurrent heat exchanger comprising:

(a) a countercurrent heat exchanger having a raw gas separator passage in which the desublimatable component of the



gas mixture desublimates, said separator passage having a first end and a second end which is to be maintained at a colder temperature than the first end;

(b) a pure gas passage in which cooled inert gas emerging from the separator passage is reheated to its starting temperature, said pure gas passage being in the countercurrent heat exchanger and having a first end and a second end which is to be maintained at a colder temperature than the first end, said pure gas passage being parallel, in countercurrent flow and thermally connected to the separator passage;

(c) at least one auxiliary passage through which an auxiliary stream can flow and which is thermally connected to the raw gas passage and the pure gas passage;

(d) means for supplying cooling energy to the auxiliary passage and providing a nonstationary temperature distribution profile in the heat exchanger;

(e) a final cooler having a passage connecting the second end of the separator passage to the second end of the pure gas passage and in which it is possible to reduce supersaturation produced in the separator passage;

(f) a filter between the separator passage and raw gas passage for collecting crystallites of the desublimate which are carried along by the gas stream.

4,181,509

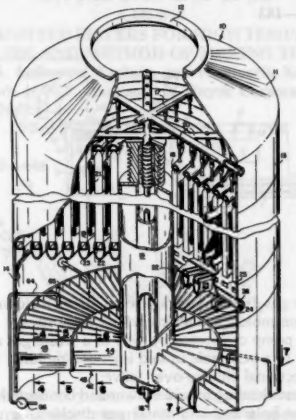
FLOW PRECONDITIONER FOR ELECTROSTATIC PRECIPITATOR

Horst Honacker, Paradise Valley, and Romuald J. Drlik, Phoenix, both of Ariz., assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 670,462, Mar. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,223, Jun. 19, 1975, abandoned. This application Dec. 1, 1977, Ser. No. 856,296

Int. Cl.[2] B03C *3/01, 3/36;* **B01D** *50/00*

U.S. Cl. 55—106 **10 Claims**



1. In an electrostatic precipitator including a housing having a cylindrical wall with a vertical axis and an outlet for purified gases at its upper end, a tangential inlet for polluted gases at the lower end of said cylindrical wall, a central tubular column coaxial with the axis of said cylindrical wall, a group of electrodes in the upper portion of said housing and comprising a plurality of cylindrical collector electrodes equi-radially spaced apart between said tubular column and said cylindrical wall, and a plurality of cylindrical discharge electrodes each of which is interposed between a pair of adjacent collector electrodes and spaced therefrom, the improvement comprising a flow preconditioner consisting of:

(a) an inverted truncated conical bottom wall attached to the lower end of said cylindrical housing wall with its lower end communicating with a discharge port in the lower end of said tubular column;

(b) a discharge pipe having an end connected to the lower end of said tubular column and passing through an opening in the lower end of said bottom wall;

(c) a plurality of spray heads angularly spaced apart in said tangential inlet;

(d) a choke ring in the form of an annular ledge mounted on said cylindrical wall and extending radially inwardly therefrom above said inlet; and

(e) an assembly of equi-angularly spaced radial vanes above said choke ring and below said group of electrodes, said vanes being generally parallel to the axis of the cylindrical housing wall, each of said vanes having:

(i) a flow receiving edge facing said tangential inlet;

(ii) a curved portion extending upwardly from said flow receiving edge and away from said inlet; and

(iii) a flat portion extending upwardly from said curved portion and parallel to the axis of said cylindrical housing wall;

said flow receiving edge and curved portion defining a trough having a camber which gradually and continuously decreases from the outer end of the vane along its span from said cylin-

drical wall to the tubular column with each vane having a chord that is constant throughout the span of the vane.

4,181,510

WASTE GAS DISCHARGING DEVICE FOR USE IN INJECTION MOLDING MACHINE

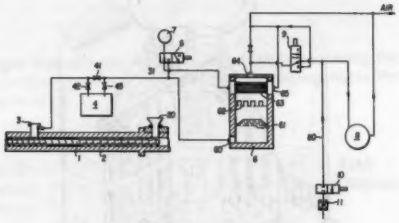
Tsutomu Sano; Naoki Takeuchi; Masanobu Kurumaji, and Susumu Nakatsukasa, all of Kobe, Japan, assignors to Kobe Steel, Limited, Kobe City, Japan

Filed Oct. 10, 1978, Ser. No. 950,050

Claims priority, application Japan, Oct. 7, 1978, 53/121098

Int. Cl.[2] B01D *19/00;* **B29F** *3/03*

U.S. Cl. 55—183 **4 Claims**



1. A waste gas discharging device including a blower for use in an injection molding machine which comprises:

a vacuum pump connected by way of a waste gas discharging unit to a vent hole in said injection molding machine;

a first directional change-over valve;

a branch path leading to said blower and connected between said vent hole and said waste gas discharging unit, said branch path being open and closed by said first change-over valve; and

a second directional change-over valve disposed between said vacuum pump and said waste gas discharging unit, whereby waste gas from said waste gas discharging unit is discharged to atmosphere without passing through said vacuum pump.

4,181,511

BACTERIA FILTERS WITH TRANSPARENT HOUSINGS

Edward A. Kippel, Suffern, N.Y., and Paul O. Huston, Montville, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Division of Ser. No. 765,111, Feb. 2, 1977, Pat. No. 4,133,656, which is a division of Ser. No. 669,622, Mar. 23, 1976, Pat. No. 4,063,913, which is a continuation-in-part of Ser. No. 500,405, Aug. 26, 1974, abandoned. This application May 19, 1978, Ser. No. 907,843

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—274 **1 Claim**

1. A bacteria filter for use in anesthesiology and respiratory air systems to filter fluid flow at a desired point in a system comprising:

an enlarged electrically non-conductive, transparent tubular housing having a passageway therethrough and having at one end a reduced tip;

an electrically conductive connector mounted to the reduced tip;

an electrically conductive end cap affixed to the end of the housing distal from the reduced tip;

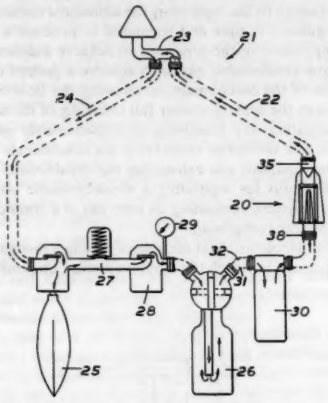
the end cap having an opening therethrough terminating in a projecting end cap connector;

a filter element mounted in the housing;

an electrically conductive portion extending between the end cap and the electrically conductive connector to provide an electrically conductive pathway from end to end of the filter including the space occupied by the transparent housing;

the connector and the projecting end cap connector being adapted to be mounted within a fluid flow system to permit fluid communication with the interior of the housing so that fluid flowing through the system passes in one end of the housing, through the filter element and out of the other end;

the connector, the housing and the end cap being arranged in a series relationship with means between the connector and the projecting end cap providing a fluid flow from said system through one end of the housing, through the



filter element and out of the other end and the electrically conductive portion being a conductive strip extending from end to end of the series relationship and being mounted entirely on the interconnected housing, connector, and end cap independent of external supporting structure; and

the electrically conductive portion extending between the end cap and the electrically conductive connector being a conductive strip of material adhered to the exterior surface of the transparent housing.

4,181,512

BACTERIA FILTERS WITH TRANSPARENT HOUSINGS

Edward A. Kippel, Suffern, N.Y., and Paul O. Huston, Montville, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Division of Ser. No. 765,111, Feb. 2, 1977, Pat. No. 4,133,656, which is a division of Ser. No. 669,622, Mar. 23, 1976, Pat. No. 4,063,913. This application May 19, 1978, Ser. No. 907,842

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—274 **1 Claim**

1. A bacteria filter for use in anesthesiology and respiratory air systems to filter fluid flow at a desired point in a system comprising:

an enlarged electrically non-conductive, transparent tubular housing having a passageway therethrough and having at one end a reduced tip;

an electrically conductive connector mounted to the reduced tip;

an electrically conductive end cap affixed to the end of the housing distal from the reduced tip;

the end cap having an opening therethrough and terminating in a projecting end cap connector;

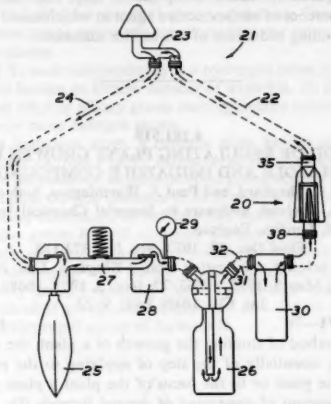
a filter element mounted in the housing;

an electrically conductive portion extending between the end cap and the electrically conductive connector to provide an electrically conductive pathway from end to end of the filter including the space occupied by the transparent housing;

the connector and the projecting end cap connector being

adapted to be mounted within a fluid flow system to permit fluid communication with the interior of the housing so that fluid flowing through the system passes in one end of the housing, through the filter element and out of the other end;

the connector, the housing and the end cap being arranged in a series relationship with means between the connector and the projecting end cap providing a fluid flow from said system through one end of the housing, through the filter element and out of the other end and the electrically conductive portion being a conductive strip extending



from end to end of the series relationship and being mounted entirely on the interconnected housing, connector, and end cap independent of external supporting structure;

the electrically conductive portion being in the form of a plurality of spaced conductive suspenders connected at one end to the end cap and at the other end to the electrically conductive connector; and

the suspenders being positioned between a double wall transparent housing so as to form a conductive basket from end to end of the filter.

4,181,513

CARBON ADSORPTIVE FILTER MATERIAL WITH LAYERS OF REINFORCING NON WOVEN FABRICS NEEDLE PUNCHED

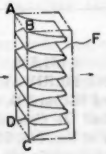
Takashi Fukuda; Masayoshi Shimada; Nobuo Ishizaki, and Shoichi Iwahori, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 561,231, Mar. 24, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 790,982

Claims priority, application Japan, Nov. 5, 1974, 49-134177[U]

Int. Cl.² B01D *46/02*

U.S. Cl. 55—316 **19 Claims**



1. An adsorptive filter material which comprises an adsorptive sheet layer of active carbon fibers having a thickness of about 0.5 to 20 mm and an active carbon fiber content of not less than 20% by weight, said active carbon fibers having an adsorption rate constant of benzene of not less than about 0.2 per minute, and reinforcing sheet layers of non-woven fabric provided on both surfaces of the adsorptive sheet layer, said reinforcing sheet layers having a pack density of about 0.03 to 0.10 g/cm^3 and a thickness of about 0.5 to 20 mm, the fibers of said non-woven fabric having a single yarn strength of not less than about 2 g/denier and an elongation of not less than about 2%, the adsorptive sheet layer and the reinforcing sheet layers being needle-punched and each weighing from about 20 to 2,000 g/m^2.

4,181,514

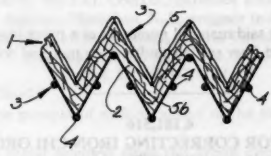
STITCH KNITTED FILTERS FOR HIGH TEMPERATURE FLUIDS AND METHOD OF MAKING THEM

Leonard R. Lefkowitz, Latham, and W. Henrik Krohn, Chatham, both of N.Y., assignors to Huyck Corporation, Wake Forest, N.C.

Filed Feb. 14, 1978, Ser. No. 877,706

Int. Cl.² B01D *39/08*

U.S. Cl. 55—488 **30 Claims**



1. A dimensionally stable filter structure for removing foreign and particulate material from high temperature fluids comprising at least one batt of relatively brittle, high temperature and corrosion-resistant fibers, said at least one batt being made up of fibers chosen from the class consisting of glass fibers, silica fibers, ceramic fibers, carbon fibers and graphite fibers, said at least one batt being stitched-knitted with high temperature, corrosion-resistant yarns such that said filter structure comprises said at least one batt encapsulated between two outer stitch-knitted layers of said high temperature, corrosion-resistant yarns integrally connected through said at least one batt at a plurality of stitch-through points therein.

16. A process of making a dimensionally stable filter structure for removing foreign and particulate material from high temperature fluids comprising the steps of providing at least one batt of relatively brittle high temperature and corrosion resistant fibers chosen from the class consisting of glass fibers, silica fibers, ceramic fibers, carbon fibers and graphite fibers, and stitch-knitting said at least one batt with high temperature corrosion resistant yarns such that said filter structure comprises said at least one batt encapsulated between two outer stitch-knotted layers of said high temperature, corrosion-resistant yarns integrally connected through said at least one batt at a plurality of stitch-through points therein.

4,181,515

METHOD OF MAKING DIELECTRIC OPTICAL WAVEGUIDES

Richard B. Dyott, and John L. Stevenson, both of London, England, assignors to The Post Office, London, England

Division of Ser. No. 614,764, Sep. 18, 1975, Pat. No. 4,077,699. This application Oct. 21, 1977, Ser. No. 844,295

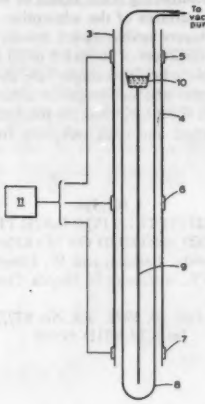
Claims priority, application United Kingdom, Sep. 24, 1974, 41598/74

Int. Cl.² C03C *25/02*; C03B *32/00*; C01B *27/00*

U.S. Cl. 65—3 A **9 Claims**

1. A method of making a dielectric optical waveguide element having a cladding and a single crystal core comprising feeding a core material in molten form into a very fine capillary fiber of a cladding material along which a temperature gradi-

ent is established, said temperature gradient extending both above and below the temperature at which said core material



melts, such that said material nucleates at a point in said fiber, and cooling said fiber so that said molten material solidifies as a single crystal.

4,181,516

PRODUCTS FOR CORRECTING IRON CHLOROSIS IN PLANTS

Kenneth R. Gray, Box 205, Shelton, Wash. 98584

Filed Aug. 22, 1977, Ser. No. 817,364

Int. Cl.[2] C09F *7/00*

U.S. Cl. 71—25 **1 Claim**

1. A method for treating of soils to minimize chlorosis of plants growing therein comprising treating said soil with a ferric complex wherein the complex is obtained from the combination of a ferric salt and the crude caustic effluent of a bleach plant in pulp manufacture.

4,181,517

1,2,3-THIADIAZOLE-2-ID DERIVATIVES, PROCESS FOR MAKING THE SAME AND COMPOSITION CONTAINING THE SAME HAVING A GROWTH REGULATING ACTIVITY FOR PLANTS

Hans-Rudolf Krüger; Reinhart Rusch, and Friedrich Arndt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

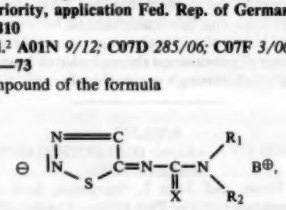
Filed Apr. 19, 1978, Ser. No. 897,858

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2719810

Int. Cl.[2] A01N *9/12*; C07D *285/06*; C07F *3/00, 3/06*

U.S. Cl. 71—73 **19 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or C_1–C_4 alkyl;

R_2 is hydrogen, C_1–C_4 alkyl, C_5–C_8 cycloalkyl optionally substituted in one or more positions by C_1–C_4 alkyl, or phenyl, pyridyl or pyrimidyl optionally substituted in one or more positions by the same or different substituents selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halogen, nitro and trifluoromethyl, or

R_1 and R_2 together with the adjoining nitrogen form a morpholino-, piperidino- or pyrrolidino group;

X is oxygen or sulfur; and

B is an alkali metal atom or a univalent zinc, manganese, calcium, magnesium or barium equivalent.

18. A growth regulating composition for plants which includes at least one 1,2,3-thiadiazoline-2-id-derivative as defined in claim 1, the derivative being present in the composition in an amount of about 10 to 80 weight percent and liquid or solid carrier materials being present in an amount of about 90 to 20 weight percent, which composition may also include 20 weight percent of surface active agent in which case there is a corresponding reduction of the carrier materials.

4,181,518

METHOD OF REGULATING PLANT GROWTH USING TRIAZOLE AND IMIDAZOLE COMPOUNDS

Margaret C. Shephard, and Paul A. Worthington, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

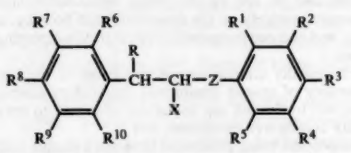
Filed Dec. 22, 1977, Ser. No. 872,112

Claims priority, application United Kingdom, Dec. 24, 1976, 54111/76; May 5, 1977, 18863/77; Dec. 5, 1977, 50481/77

Int. Cl.[2] A01N *5/00, 9/22*

U.S. Cl. 71—76 **2 Claims**

1. A method of stunting the growth of a plant, the method consisting essentially of the step of applying to the plant, to seed of the plant or to the locus of the plant a plant growth stunting amount of compound of general formula (I):



wherein R is alkyl, alkenyl or alkynyl having up to 4 carbon atoms, cyano or phenyl optionally substituted with one, two or three halogen, C_{1-4} alkyl, nitro, trifluoromethyl, cyano, phenyl, C_{1-4} alkoxy or (C_{1-4} alkylene)-dioxy, benzyl optionally ring-substituted with one, two or three halogen, C_{1-4} alkyl, nitro, trifluoromethyl, cyano, phenyl, C_{1-4} alkoxy or (C_{1-4} alkylene)dioxy and/or substituted on the α-carbon atom with alkyl, alkenyl or alkynyl having up to 4 carbon atoms, phenyl, benzyl, cyano, (C_{1-4} alkoxy)carbonyl or trihalomethyl, Z is C=O, each of R^1 to R^{10}, which may be the same or different, is hydrogen, halogen, phenyl, C_{1-4} alkyl, C_{1-4} alkoxy, nitro or mono- or di-(C_{1-4} alkyl)-, phenyl- or benzyl-substituted or unsubstituted amino, at least six of R^1 to R^{10} being hydrogen, and X is 1,2,4-triazol-1-yl, or an acid addition salt or metal complex thereof.

4,181,519

DIPHENYLAMINE DERIVATIVE HERBICIDES

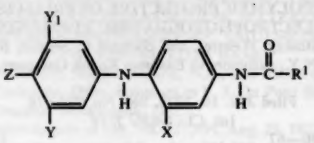
Kurt H. G. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 876,593, Feb. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 761,515, Jan. 21, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,633

Int. Cl.[2] C07C *103/737, 103/44*; A01N *9/12, 9/14*

U.S. Cl. 71—98 **12 Claims**

1. A compound of the formula



wherein

X is a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl group containing from 1 to 6 carbon atoms optionally substituted by one or more halogen atoms;

Y and Y_1 each independently is a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl or alkoxy group each optionally substituted by one or more halogen atoms;

Z is a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, an alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group in each of which the alkyl portion contains from 1 to 6 carbon atoms optionally substituted by one or more halogen atoms, or an amino group R^2R^3N in which R^2 and R^3 each independently is a hydrogen atom or an alkyl or cycloalkyl group containing up to 6 carbon atoms or R^3 can also be an alkoxy group containing from 1 to 6 carbon atoms;

R^1 is an alkyl group containing from 1 to 4 carbon atoms, or a cyclopropyl group of formula II

(II)

in which R^4 is a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms or a halogen atom having an atomic number of from 9 to 35, inclusive; with the proviso that when Z is a hydrogen atom then X is other than an alkyl group substituted by one or more halogen atoms and when R^1 is a group of formula II then at least one of Y, Y^1 and Z is other than a hydrogen atom or when R^1 is alkyl then at least two of Y, Y^1 and Z is other than a hydrogen atom.

12. A method for controlling undesirable plant growth at a locus to be protected which comprises applying to the locus to be protected a herbicidally effective amount of a compound according to claim 1.

4,181,520

PROCESS FOR THE DIRECT REDUCTION OF IRON OXIDE-CONTAINING MATERIALS IN A ROTARY KILN

Gerhard Reuter, and Wolfram Schnabel, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

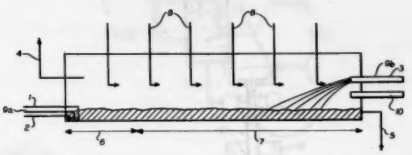
Continuation of Ser. No. 647,830, Jan. 9, 1976, abandoned. This application Oct. 19, 1978, Ser. No. 952,870

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1975, 2501182

Int. Cl.[2] C21B *13/08*

U.S. Cl. 75—36 **12 Claims**

1. Process for the direct reduction of iron oxide-containing materials to produce sponge iron which comprises treating the iron oxide-containing-materials with separate solid carbonaceous reducing agents in a rotary kiln at a temperature below the softening and melting point of the charge, the kiln atmosphere flowing opposite to the direction of movement of the charge, at least part of the said solid carbonaceous reducing agents being charged in agglomerated form into the rotary kiln at the charging end thereof, feeding oxygen-containing gases into the rotary kiln, charging said highly reactive, solid carbonaceous reducing agents which contain 20–50% volatile constituents in agglomerated form and are capable of being consumed to an extent of at least about 98% into the rotary kiln at the charging end thereof and heating same up at such a rate that the said reducing agents disintegrate into fine particles substantially in and before the end of the heating-up zone of the



rotary kiln and wherein the carbon contained in the matter discharged from the rotary kiln amounts to less than 2% by weight, by weight of the quantity of iron oxide-containing material which has been charged.

4,181,521

PREPARATION OF GLASS-FORMING ALLOYS UNDER A REFINING METAL OXIDE/BORON TRIOXIDE SLAG

Wiktor J. Ambasz, Metuchen, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 17, 1978, Ser. No. 925,578

Int. Cl.[2] C21C *3/04*

U.S. Cl. 75—53 **9 Claims**

1. In the process of making alloys of the formula $M_aP_bY_c$ wherein

M is a metal selected from the group consisting of iron, cobalt, nickel, and mixtures thereof in any proportion,

P represent phosphorus,

Y is a metalloid selected from the group consisting of boron, carbon, and mixtures thereof in any proportion,

a, b, and c are in atomic percent; and

a is about 70 to 90,

b is 0 to 20,

c is 0 to 30,

the sum of b+c is about 10 to 30,

the sum of a+b+c being 100,

the improvement which comprises holding the molten alloy in contact with a slag comprising oxides selected from the group consisting of oxides of iron, nickel, and cobalt and mixtures thereof together with boron trioxide.

4,181,522

METHOD OF RETARDING THE COOLING OF MOLTEN METAL

Jean Galey, Voisins Bretonneux; Gerard Bentz, Elancourt-Trappes; Pierre Karinthi, Joy-en-Josas; Ghislain Gilbert, Bures-sur-Yvette, and Serge Devalois, Fourqueux, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 592,077, Jun. 30, 1975, Pat. No. 4,093,553. This application Jan. 23, 1978, Ser. No. 871,981

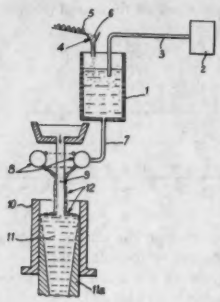
Claims priority, application France, Jul. 5, 1974, 74 23386

Int. Cl.[2] C22B *9/00*

U.S. Cl. 75—96 **1 Claim**

1. A method of reducing heat loss from the upper surface of a body of molten metal, comprising establishing on said upper surface a layer of a cryogenic liquid selected from the group consisting of nitrogen, helium and argon, and suspending in said cryogenic liquid 10 to 1000 grams per liter of cryogenic liquid, of at least one finely divided material in the form of particles having a size between 200 and 2000 Å, said material being selected from the group consisting of aluminum, titanium, zirconium, niobium, calcium, lithium, magnesium, solid glass, and an oxide of aluminum, titanium, zirconium, niobium,

calcium, lithium or magnesium, thereby to maintain a homogeneous and stable suspension of said material in said cryogenic



liquid and to reflect infra-red radiation from said suspended particles back toward said molten metal.

4,181,523

NICKEL-BASE WEAR-RESISTANT ALLOY

Kirit J. Bhansali, 1512 Pontiac Dr., Kokomo, Ind. 46901

Filed Oct. 10, 1978, Ser. No. 949,830

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—171 **10 Claims**

1. A nickel-base alloy consisting essentially of, in weight percent, 35 to 50 chromium, 2.5 maximum molybdenum plus tungsten, 0.65 to 3 boron, 0.1 to 1.0 carbon, 3 to 5 silicon, 5 maximum iron, 7.5 maximum cobalt, 4 maximum total content of vanadium, tantalum, columbium, titanium and manganese, up to 2.5 copper, and the balance nickel plus incidental impurities.

4,181,524

FREE MACHINING HIGH SULFUR STRAND CAST STEEL

John H. Bucher, and Eugene J. Paliwoda, both of Bethel Park, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Jun. 12, 1978, Ser. No. 914,326

Int. Cl.[2] C22C *38/04, 38/60*

U.S. Cl. 75—123 G **3 Claims**

1. A free machining high sulfur strand-cast steel billet characterized in having a microstructure containing a uniform distribution of small manganese sulfide particles and consisting of about 0.90 to 0.48% carbon, 1.05 to 1.35% manganese, 0.40 to 0.65% sulfur, 0.01 to 0.30% silicon, and the balance substantially all iron with incidental impurities.

4,181,525

SELF-BONDING FLAME SPRAY POWDERS FOR PRODUCING READILY MACHINABLE COATINGS

Edward R. Novinski, Mineola, N.Y., assignor to Metco, Inc., Westbury, N.Y.

Filed Jul. 19, 1978, Ser. No. 926,070

Int. Cl.[2] B22F *7/00*

U.S. Cl. 75—255 **13 Claims**

1. A flame spray powder comprising particles having a core comprising a member selected from the group consisting of nickel, iron, copper, cobalt and alloys thereof, coated with a binder containing discrete particles of aluminum and substantially pure nickel.

4,181,526

INTERPOLYMER PROTECTIVE OVERCOATS FOR ELECTROPHOTOGRAPHIC ELEMENTS

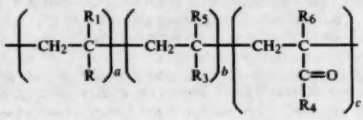
Cathy L. Blakey, Webster, and Richard C. Sutton, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,174

Int. Cl.[2] G03G *5/14*

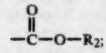
U.S. Cl. 430—67 **16 Claims**

1. An electrophotographic element having a electrically insulating overcoat layer, wherein said overcoat layer comprises a polymer having recurring units according to the structure:



in which

R represents phenyl, tolyl, xylyl or



R_1, R_5 and R_6, which may be the same or different, represent hydrogen or methyl;

R_2 represents alkyl or aryl;

R_3 represents a carboxyl, alkyl ester, aryl ester, alkylamide or arylamide group having at least one carboxyl or hydroxyl or carboxylic anhydride substituent;

R_4 represents a group containing an active methylene group;

a is about 29 to about 96 weight percent of said polymer;

b is about 2 to about 25 weight percent of said polymer; and

c is about 2 to about 46 weight percent of said polymer.

4,181,527

PHOTOGRAPHIC MATERIAL COMPRISING ORGANIC SOLVENT GELLING AGENT

Yuzo Toda; Yasuo Mukunoki, and Junji Koizumi, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 20, 1978, Ser. No. 888,446

Claims priority, application Japan, Mar. 31, 1977, 52-36294

Int. Cl.[2] G03C *1/40, 1/48, 1/10, 1/84*

U.S. Cl. 430—543 **9 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer and containing an emulsified dispersion comprising an organic solvent emulsified, as a discontinuous phase, in at least one layer of a hydrophilic colloid as a continuous phase and an organic solvent gelling agent present in said organic solvent and/or in said at least one hydrophilic colloid layer.

4,181,528

SUBBING COMPOSITION COMPRISING TREATED GELATIN-POLYESTER-AZIRIDINE MATERIAL FOR ADHERING PHOTOGRAPHIC EMULSION TO POLYESTER FILM BASE

Ray A. Work, III, Hendersonville, N.C., and Richard P. Pankratz, Circleville, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 827,594, Aug. 25, 1977, which is a continuation-in-part of Ser. No. 791,516, Apr. 27, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 887,344

Int. Cl.[2] G03C *1/04*

U.S. Cl. 428—474 4 Claims

1. An article of manufacture comprising an oriented heat-set energy-treated polyester shaped article carrying a layer of a reaction product of gelatin, a water-soluble polyester, and a polyfunctional aziridine.

4,181,529

HARDENING OF PROTEINACEOUS MATERIALS

Francis J. Sels, Kontich; Hendrik E. Kokelenberg, Merksem, and George F. Van Veelen, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed May 9, 1978, Ser. No. 904,277

Claims priority, application United Kingdom, May 10, 1977, 19576/77

Int. Cl.[2] G03C *1/30;* C09H *7/00*

U.S. Cl. 430—626 8 Claims

1. A process for hardening proteinaceous material which comprises the step of treating said material with an aqueous solution of a partial hydrolysis product of cyanuric chloride wherein the aqueous solution of a partial hydrolysis product is buffered by means of a water-soluble borate.

4,181,530

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL HAVING REDUCED FOG

Shinpei Ikenoue; Nobuyoshi Sekikawa, and Takao Masuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 14, 1978, Ser. No. 924,589

Claims priority, application Japan, Jul. 15, 1977, 52-84699

Int. Cl.[2] G03C *1/02, 1/34, 1/06, 5/24*

U.S. Cl. 430—620 18 Claims

1. A thermally developable light-sensitive material comprising a support having therein or in one or more layers thereon (a) an organic silver salt, (b) a photo catalyst and (c) a reducing agent and further containing (d) a phthalimide having at least one electron-attracting substituent thereon, wherein the electron-attracting substituent is selected from the group consisting of a cyano group, a halogen atom, a nitro group, an acyl group having 2 to 20 carbon atoms, an acyloxy group having 2 to 20 carbon atoms, an alkoxycarbonyl group having 2 to 20 carbon atoms, an acylamino group having 2 to 20 carbon atoms, an acylthio group having 2 to 7 carbon atoms and a sulfonamide group having 1 to 10 carbon atoms, wherein said phthalimide prevents heat fog in said thermally developable light-sensitive material and wherein said thermally developable light-sensitive material further contains a toning agent.

4,181,531

POSITIVE NON-SILVER SYSTEMS CONTAINING NITROFURYLDIHYDROPYRIDINE

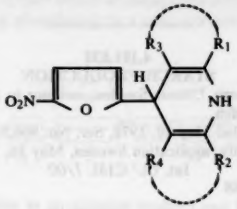
Otto Pilz, Langen, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1978, Ser. No. 894,551

Int. Cl.[2] G03C *1/68*

U.S. Cl. 430—270 6 Claims

1. A photosensitive element for the preparation of positive images which comprises a support bearing a photosensitive layer comprising at least one organic polymeric binder and a dihydropyridine compound, the improvement being that the dihydropyridine compound is of the formula



wherein

R_1 and R_2 are alkyl, aryl, substituted aryl and heterocyclic ring,

R_3 and R_4 are COOR', COR' and CN, R' is alkyl, substituted alkyl, or aryl,

and

R_1 and R_3 and/or R_2 and R_4 when taken together can form a 5- or 6-membered carbocyclic or heterocyclic ring.

4,181,532

PRODUCTION OF COLLOIDAL DISPERSIONS

James L. Woodhead, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 733,153, Oct. 18, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,484

Claims priority, application United Kingdom, Oct. 22, 1975, 43436/75

Int. Cl.[2] C04B *21/00, 35/44;* B01J *13/00*

U.S. Cl. 106—40 R 7 Claims

1. A colloidal dispersion comprising dispersed in water, a compound selected from the group consisting of yttrium and lanthanide (rare earth) element compounds and colloidal particles of alumina produced by vapor phase condensation.

4,181,533

WELL CEMENTING IN PERMAFROST

William N. Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 928,648, Jul. 27, 1978. This application Jan. 31, 1979, Ser. No. 8,304

Int. Cl.[2] C04B *7/32*

U.S. Cl. 106—104 5 Claims

1. A cementitious composition for cementing in a permafrost region of a wellbore consisting essentially of aqueous drilling fluid used in drilling through permafrost and having a solids content of from about 2 to about 16 volume percent solids; from about 0.01 to about 1.5 weight percent of an additive selected from the group consisting of lignosulfonate, lignite, tannin, and mixtures thereof, from about 8 to about 40 weight percent of at least one cementitious material high in alumina which will harden in from about 30 to about 40 hours at about 40° F., and said composition having a pH in the range of from about 9 to about 12.

4,181,534

PROCESS FOR PRODUCING A CLEAN PENTOSAN ENRICHED PERICARP

Verl E. Headley, Willowbrook, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Sep. 12, 1977, Ser. No. 832,319

Int. Cl.[2] C13L *1/02*

U.S. Cl. 127—67 10 Claims

1. A process for producing an improved clean pentosan enriched pericarp from mixed fiber obtained from the hydroprocessing of corn which comprises the steps of:

(a) drying the mixed fiber to a moisture level of from about 42% to about 60% by weight;

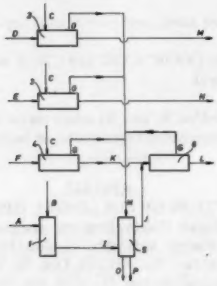
(b) abrading the dried fiber to separate a clean pentosan enriched pericarp fraction and a fines fraction; and
(c) recovering the clean pericarp fraction and the fines fraction.

4,181,535

STARCH PRODUCTION

Bengt I. Dahlberg, Uttran, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 10, 1978, Ser. No. 904,376
Claims priority, application Sweden, May 16, 1977, 7705679
Int. Cl.[2] C13L *1/00*
U.S. Cl. 127—68 **3 Claims**



1. A method of producing starch and byproducts from maize, which comprises the steps of steeping the corn in water with the addition of sulphur dioxide at an elevated temperature, evaporating the water phase from the steeping step in a multistage evaporator to a steeping concentrate, dividing the steeped corn into an aqueous germ fraction, an aqueous fiber fraction and a gluten suspension, partly dewatering said suspension to an aqueous gluten fraction, drying said germ fraction, fiber fraction and gluten fraction to a low residual water content by passing each said fraction into contact with a hot air flow, thereby causing steam flows from said germ fraction, fiber fraction and gluten fraction, mixing said steam flows with said air flow, said method being characterized by the further steps of limiting the air flow, when drying said germ, fiber and gluten fractions, to make the enthalpy of the steam-air flows relatively high, and feeding at least part of said steam-air flows to one of the stages of said multistage evaporator for evaporating the water phase from the steeping step, whereby said steam-air flows give off part of their available thermal energy, said steam-air flows being combined before being fed to said one stage of the evaporator, the air flow and heat input in said drying step being so controlled that the relationship between the amount of steam and the amount of air in the combined steam-air flow is at least 0.4 kg/kg.

4,181,536

PROCESS FOR THE CLEANING OF FOULED HEAT EXCHANGERS AND OTHER EQUIPMENT

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Dec. 6, 1978, Ser. No. 967,036
Int. Cl.[2] B08B *3/08, 9/00*
U.S. Cl. 134—2 **7 Claims**

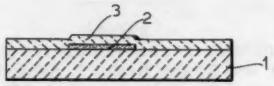
1. The process for cleaning heat exchangers and other processing equipment whose surfaces have become fouled with sludge deposits during the passage through said equipment of a liquid sorbent that comprises a cuprous aluminum tetrahalide and an aromatic hydrocarbon solvent that comprises the steps of contacting the portions of the equipment that contain said sludge deposits with a cleaning solution that is an aqueous solution that contains from 2% to 35% by weight of ammonium chloride at a temperature in the range of 0° C. to 50° C. until substantially all of the deposited sludge has been dissolved or loosened from said surfaces, washing said portions of the equipment with water at a temperature in the range of 10° C. to 80° C. to remove loosened sludge and residual cleaning solution, and drying said portions of the equipment.

4,181,537

METHOD OF FABRICATING AN INSULATED GATE FIELD EFFECT DEVICE

Eisuke Ichinohe, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 10, 1977, Ser. No. 805,576
Claims priority, application Japan, Jun. 15, 1976, 51-70573
Int. Cl.[2] H01G *7/00;* H01L *7/44, 11/14, 29/04*
U.S. Cl. 148—1.5 **2 Claims**



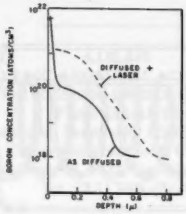
1. A method of fabricating an insulated gate field effect device having a polycrystalline silicon gate, with a silicon substrate of a first conductivity type having deposited therein source and drain regions of a second conductivity type, with a gate insulator layer and a polycrystalline silicon layer sequentially formed on the surface of said substrate defining a gate region between said source and drain regions, with interconnection layers of polycrystalline silicon contacting the source and drain regions, and with a field isolating region surrounding said source, gate and drain regions, comprising the steps of:
forming a gate insulator layer on the surface of a semiconductor substrate;
depositing a polycrystalline silicon layer on the surface of the semiconductor substrate covering at least said gate insulator layer and the regions to be formed into the source and drain regions;
forming an oxidation barrier layer in a first pattern covering said gate insulator layer and the regions to be formed into the source and drain regions, and extending only to the edge of the gate insulator layer at the regions where the gate is bounded by the field isolation regions;
selectively removing a part of the polycrystalline silicon layer by using said first pattern of the oxidation barrier layer as a masking pattern to prevent removal of the polycrystalline silicon layer thereunder;
oxidizing the substrate to form the field isolation regions by using said first pattern of the oxidation barrier layer as a masking pattern to prevent oxidation of the substrate thereunder;
forming a second pattern of the oxidation barrier layer by selectively removing portions of said oxidation barrier layer above the regions to be formed into the source and drain regions;
forming source and drain regions within the semiconductor substrate through said portions where said oxidation barrier layer has been removed;
selectively oxidizing parts of said polycrystalline silicon layer with said second pattern of the oxidation barrier layer as a masking pattern to prevent oxidation of the polycrystalline silicon layer thereunder, to form isolating layers to electrically insulate the thus distinguished polycrystalline silicon layers from each other and to construct a gate electrode and interconnection layers contacting the source and the drain regions, respectively;
removing the oxidation barrier layer; and
providing an interconnection pattern for contacting the gate electrode and the interconnection layers, respectively.

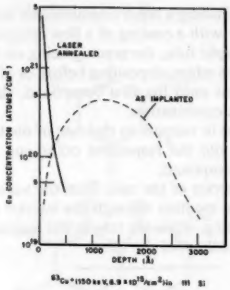
4,181,538

METHOD FOR MAKING DEFECT-FREE ZONE BY LASER-ANNEALING OF DOPED SILICON

Jagdish Narayan, Knoxville; Clark W. White, Oak Ridge, and Rosa T. Young, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1978, Ser. No. 945,925
Int. Cl.[2] H01L *21/26, 21/268*
U.S. Cl. 148—1.5 **9 Claims**





8. A method for treating a surface layer of junction free silicon semiconductor material, said layer having dispersed therein an impurity selected from the group consisting of copper and iron to effect segregation of said impurity in a near-surface portion of said layer, said method comprising:

irradiating said layer with at least one laser pulse selected from one of (a) Q-switched ruby laser-generated pulses having a wavelength of 0.694 μm, an energy density in the range of from about 1.5 to 3.0 J/cm², and a duration in the range of from about 20 to 50 nanoseconds and (b) Q-switched YAG laser-generated pulses having a wavelength of 1.06 μm, an energy density in the range of from about 5 to 7 J/cm², and a duration in the range of from about 80 to 120 nanoseconds to effect melting of said layer.

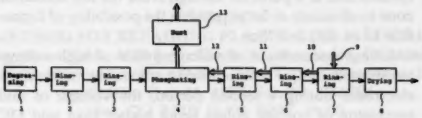
4,181,539

PROCESS OF PHOSPHATING AN IRON SUBSTRATE IN A CLOSED SYSTEM USING AROMATIC NITRO COMPOUND ACCELERATORS

Ryoichi Murakami, Kyoto; Yukio Anegawa; Minoru Ishida, both of Sakai, and Keizi Masada, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed May 10, 1978, Ser. No. 905,177
Claims priority, application Japan, May 11, 1977, 52-54720
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 R **7 Claims**

1. In a process for phosphating the surface of an iron substrate by treatment of the said surface with a phosphating solution in a closed system phosphating installation, the improvement wherein the phosphating solution is an aqueous solution consisting essentially of at least one of alkali metal and ammonium phosphates, in a concentration of from about 1 to 15 g/liter and at least one of aromatic nitro compounds capable of accelerating phosphating in a concentration of from about



1.05 to 5 g/liter in an aqueous medium and having a pH of about 3 to 6.5, and the process is performed at a temperature of from about 40° to 55° C.

4,181,540

METAL SURFACE TREATMENT METHOD

Robert E. Ahlf, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 26, 1978, Ser. No. 909,776
Int. Cl.[2] C23F *7/10, 7/26*
U.S. Cl. 148—6.15 R **15 Claims**

1. A process for smoothing a metal surface having irregularities comprising:

(a) applying to said metal surface a solution capable of oxidizing the metal of said surface to form a friable conversion coating relatively impervious to and insoluble in said solution thereon;

(b) abrading said coated metal surface with a conforming surface to remove said coating from portions of said metal surface and thereby re-expose said surface portions to said solution to reform said conversion coating at said exposed surface portions;

(c) repeating said oxidation and abrasion steps until said coated metal surface is substantially smooth; and

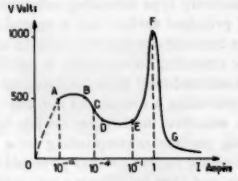
(d) washing said solution and removed material carried thereby from said coated surface.

4,181,541

THERMOCHEMICAL TREATMENT SYSTEM AND PROCESS

Philippe LeFrancois, Neuilly-en-Thelle, France, assignor to Vide et Traitement S.A., Neuilly-en-Thelle, France

Filed Feb. 7, 1978, Ser. No. 875,762
Claims priority, application France, Feb. 8, 1977, 77 03501
Int. Cl.[2] C23C *11/12, 13/02, 13/12*
U.S. Cl. 148—16.6 **5 Claims**



1. In a process for the thermochemical treatment of a metal selected from the group consisting of steel and steel alloys, wherein the metal is subjected to ionic bombardment in a furnace having a cathode electrode and an anode electrode, the metal being treated being disposed on said cathode electrode, and the furnace contains ammonia gas for use in carrying out the thermochemical treatment, and the gas is brought to a very low pressure, the improvement comprising the steps of:

establishing a DC voltage between said anode and cathode electrodes, to bring the metal as quickly as possible to the treatment temperature, and

operating the furnace during a first period with said DC voltage at an operating point which lies in the zone of abnormal discharge of the voltage-intensity curve of the furnace and at a point far enough from the arc formation zone to eliminate as far as possible the possibility of formation of an arc, and then

establishing a succession of voltage pulses of high voltage but limited energy between said cathode and said anode electrodes during a second period, the voltage of said succession of voltage pulses being higher than said DC voltage, and

moving the operating point of the furnace along the voltage-intensity curve to a limit point far enough from the arc formation zone in order to prevent the formation of an arc during the course of each of the succession of the pulses with high voltage but limited energy.

4,181,542

METHOD OF MANUFACTURING JUNCTION FIELD EFFECT TRANSISTORS

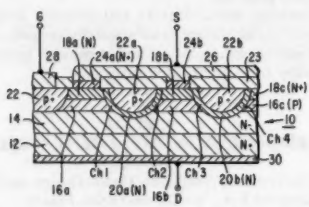
Takashi Yoshida; Takeshi Matsuyama; Tamaki Kuki, and Takayuki Kodaka, all of Hamamatsushi, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 25, 1977, Ser. No. 845,202

Claims priority, application Japan, Oct. 25, 1976, 51-128048; Nov. 9, 1976, 51-134567

Int. Cl.[2] H01L *21/225*

U.S. Cl. 148—187 **5 Claims**



1. A method of manufacturing a junction field effect transistor comprising the steps of:

preparing a semiconductor substrate which has one principal surface and which includes a first semiconductor layer of one conductivity type extending substantially in parallel with said principal surface and a second semiconductor layer of an opposite conductivity type to said one conductivity type extending substantially in parallel with and on said first semiconductor layer, said second semiconductor layer for providing a source and a drain;

providing a selective mask layer which has an impurity transmitting portion corresponding to a predetermined channel forming pattern on said principal surface;

depositing on and slightly diffusing into said principal surface through said impurity transmitting portion a first impurity of said opposite conductivity type;

depositing and slightly diffusing into said principal surface through said impurity transmitting portion a second impurity of said one conductivity type, said second impurity type being diffused shallower than said first impurity type, said second impurity type for providing a gate; and

drive-in diffusing said first and second impurities into said substrate to such a depth that at least said first impurity reaches said first semiconductor layer, said second impurity diffusing to a depth shallower than said first impurity and said first impurity forming a channel.

4,181,543

MAKING A SUPER CONDUCTOR

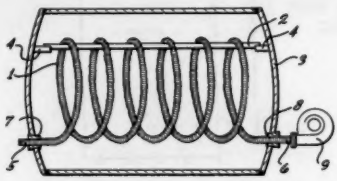
Friedrich Schatz, Langenhagen; Karl-Heinz Marx, Garbsen, and Peter Rohner, Isernhagen, all of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 18, 1979, Ser. No. 4,563

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805307

Int. Cl.[2] C21D *1/00*; H01V *11/00*

U.S. Cl. 148—127 **5 Claims**



1. A method for making a super conductor by using a metallic strip as a carrier with a coating of a first component, forming the strip into a split tube, the coating being on the outside, and seam welding its edges, depositing before or after welding a second component onto the first compound, the improvement comprising in combination:

annealing the tube in vacuum so that one of the two components diffuses into the respective other one to form an intermetallic compound;

separating the interior of the tube from the vacuum; and

flushing a cooling medium through the interior of the tube after the annealing, while the tube is still maintained in the vacuum, to rapidly cool the tube.

4,181,544

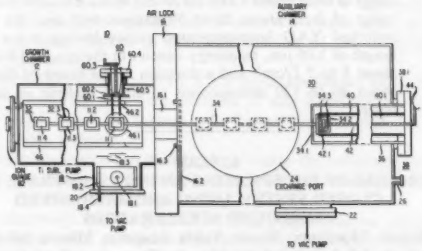
MOLECULAR BEAM METHOD FOR PROCESSING A PLURALITY OF SUBSTRATES

Alfred Y. Cho, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 755,663, Dec. 30, 1976, Pat. No. 4,137,865. This application Oct. 30, 1978, Ser. No. 956,066

Int. Cl.[2] H01L *21/203*; C23C *13/08*

U.S. Cl. 148—175 **3 Claims**



1. In conjunction with apparatus which includes an evacuable growth chamber, an evacuable auxiliary chamber, gate means for alternately placing said chambers in communication with one another and for isolating said chambers from one another; a method for the molecular beam deposition of semiconductor material sequentially on a plurality of substrates comprising the steps of:

generating at least one molecular beam directed to a growth position within said growth chamber;

sequentially moving said substrates from said auxiliary chamber to said growth position for a time period effective to deposit thereon layers of said material of the desired thickness; characterized by:

selectively heating said substrates within said growth chamber so that only the substrate in said growth position (the growth substrate) is heated at any one time, the other (idle) substrates being unheated;

cryogenically cooling a surface which surrounds said growth position and all of said substrates within said growth chamber to reduce contamination of said idle substrates.

4,181,545

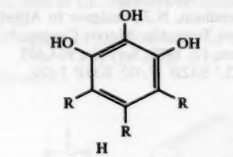
HYDROXYLIC AROMATIC COMPOUNDS AS ADDITIVES FOR RUBBER-BASED, COMPOSITE SOLID PROPELLANTS

William S. Anderson, Sunnyvale, Calif., assignor to United Technologies Corporation, Hartford, Conn.

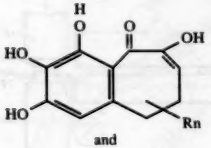
Filed Apr. 28, 1977, Ser. No. 791,893
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.9 **16 Claims**

8. (a) A curable polymeric system comprising a hydroxy-functional polybutadiene; and

(b) A material selected from the group consisting of:

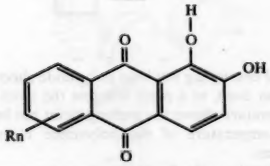


(a)



(b)

and



(c)

wherein R is a radical which does not interfere with the curability of the polymeric system.

4,181,546

WATER RESISTANT BLASTING AGENT AND METHOD OF USE

Robert B. Clay, 728 W. 3800 South St., Bountiful, Utah 84010

Continuation-in-part of Ser. No. 834,772, Sep. 19, 1977, Pat. No. 4,111,727. This application Aug. 25, 1978, Ser. No. 936,926
Int. Cl.² C06B *45/02*
U.S. Cl. 149—21 **18 Claims**

1. A blasting composition consisting essentially of a combination of:

(a) 40 to 60% by weight, based on the total composition, of a water-in-oil emulsion comprising powerful oxidizer salt in aqueous solution, said solution being dispersed in an outer continuous oil phase and including a gas-trapping density-reducing material to sensitize the composition and improve its detonability,

(b) 60 to 40% by weight of a substantially solid particulate oxidizer consisting primarily of ammonium nitrate, and

(c) the emulsion being blended through and into the solid particulate oxidizer so as to fill substantially completely the voids and interstices in and between the solid particles so as to substantially exclude water.

4,181,547

METHOD FOR REPAIRING PLASTIC-LIKE MATERIALS

Lawrence Speer, 4380 Inner Circle Dr., Brunswick, Ohio 44212

Continuation of Ser. No. 684,889, Jan. 14, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,921
Int. Cl.² B32B *35/00*; B29C *23/00*
U.S. Cl. 156—98 **4 Claims**

TRIM THE DAMAGED AREA TO BE PATCHED
PLACE BACKING MATERIAL BEHIND DAMAGE
FILL DAMAGE WITH HEAT CURABLE PATCHING COMPOUND
PLACE GRAINING PAPER OVER DAMAGE & SURROUNDING SURFACE
APPLY HEAT TRANSFER TOOL TO HOUSEHOLD IRON & THEN APPLY TO GRAINING PAPER OVER THE DAMAGE

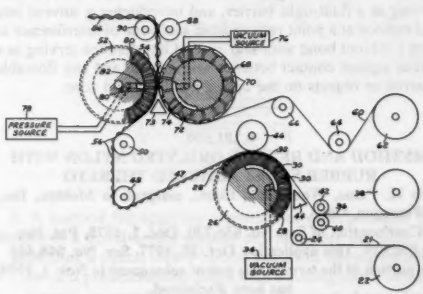
2. A repair procedure for repairing damage in thermoplastic film comprising the steps of trimming the edges of the damage, placing a backing material behind suchddamage, filling the damage with a heat-curable, film forming patching compound, placing a graining paper over such patching compound, adding a substantially fixed quantum of heat energy to a heat transfer tool by placing said tool against a source of heat at a temperature above that temperature necessary to cure such patching compound, said heat transfer tool having a volume and geometric shape such that it can transfer a quantum of heat sufficient to cure such patching compound but insufficient to damage said thermoplastic film, heating said tool to substantially the temperature of said source, transferring said substantially fixed quantum of heat energy from said heat transfer tool by placing said tool against the graining paper over such damage for a time to effect curing of such compound and removing said tool and such graining paper.

4,181,548

LAMINATED PLASTIC PACKAGING MATERIAL

Joseph L. Weingarten, 1927 Oak Tree Dr., Kettering, Ohio 45440

Division of Ser. No. 884,056, Mar. 6, 1978. This application Sep. 12, 1978, Ser. No. 941,716
Int. Cl.² B32B *3/12, 1/00*
U.S. Cl. 156—145 **1 Claim**



1. In a method for the continuous fabrication of laminated cushioning material including the steps of heating a first layer of thermoplastic material above the softening temperature of the thermoplastic; passing the softened material over a first

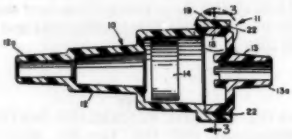
forming roller including a plurality of depressions in the outer surface; supplying a vacuum to the depressions to draw portions of the softened thermoplastic layer into the depressions; passing a second layer of thermoplastic over the roller in contact with the first layer to form air pockets between the first layer and second layer; heating the first layer and second layer to a fusing temperature prior to application of the second layer; passing the first and second layer past a heated pressure roller adjacent the first roller; removing the fused layer from the first roller; forming a plurality of air pockets on the side of said first layer remote from said second layer with the additional steps comprising: heating a third layer of thermoplastic material above the softening temperature of the thermoplastic; passing the softened material over a second forming roller including a plurality of depressions in the outer surface; supplying a vacuum to the depressions to draw portions of the softened thermoplastic layer into the depressions; passing the fused layers and the third layer between a second pressure roller and the second forming roller; said second pressure roller including a plurality of depressions adapted to receive the air pockets on said fused layers; supplying a pressure to the depressions of the second roller adjacent the second forming roller to supply a pressure to the fused layer equal to the pressure between the second pressure roller and the second forming roller; heating the fused layer and the third layer to a fusing temperature prior to passing between the second pressure roller and the second forming roller; removing the three fused layers from the second forming roller.

4,181,549

SOLVENT-BONDED JOINT AND METHOD OF MAKING THE SAME

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 10, 1977, Ser. No. 776,435
Int. Cl.[2] C09J *5/00*; B29C *27/10*; F16L *13/10*
U.S. Cl. 156—146 **21 Claims**



1. The method of joining two plastic members comprising forming said members for frictional engagement therebetween in a fluid-tight zone of interference with a tapered crevice leading to said zone of interference, fitting said members together in frictional engagement with said zone of interference serving as a fluid-tight barrier, and introducing a solvent into said crevice at a point remote from said zone of interference to form a solvent bond with said zone of interference serving as a barrier against contact between said solvent and any flowable material or objects on the opposite side of said zone.

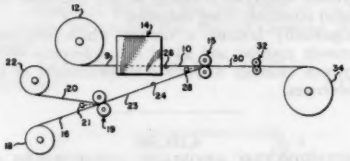
4,181,550

METHOD AND BELT OF ORIENTED NYLON WITH RUBBER SHEET ADHERED THERETO

Ellis H. Paine, Woodstock, Conn., assignor to Moldex, Inc., Wauregan, Conn.

Continuation of Ser. No. 636,730, Dec. 1, 1975, Pat. No. 4,056,419. This application Oct. 28, 1977, Ser. No. 846,446
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B32B *31/08*; C09J *5/02*
U.S. Cl. 156—164 **5 Claims**

1. The method of producing a high tensile strength laminate containing a layer of oriented nylon, comprising the steps of heat bonding a layer of rubber to a sheet of nylon film to form a first laminate, bringing said first laminate into surface contact with said layer of oriented nylon such that said sheet of nylon film is in face-to-face relation with said layer of oriented nylon, said layer of rubber and said layer of oriented nylon being continuous sheets of uniform width, introducing a nylon adhesive between said layer of oriented nylon and said sheet of



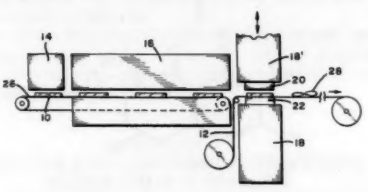
nylon film to bond said sheet of nylon film to said layer of oriented nylon, and moving said first laminate and said layer of oriented nylon together between a pair of mating rolls which exert a pressure and a temperature of substantially less than 220° F., whereby said sheet of nylon film provides the sole bond between said rubber and said layer of oriented nylon.

4,181,551

METHOD OF PRODUCING STAMPED PLASTIC ARTICLES

Lowell G. Ward, Mendham, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 12, 1978, Ser. No. 914,657
Int. Cl.[2] B32B *31/00*; B31F *1/00*
U.S. Cl. 156—199 **14 Claims**



1. A method of conveying hot limp polyamide sheet compositions through an oven, to a press wherein the oven is maintained at a temperature above the melting point but below the decomposition temperature of the polyamide resin, which method comprises:

(a) heating said polyamide sheets in an oven to a temperature from about the melting point to a temperature below the decomposition temperature of the polyamide so that the polyamide sheet is in a limp condition;

(b) providing a conveying surface comprised of a glass fiber veil of indefinite length to support said polyamide sheets and convey same into position in a press between two components of a die;

(c) stopping movement of said veil when a polyamide sheet is positioned between two components of said die;

(d) actuating at least one component of said die to shape the sheet and veil thereby bonding said veil to the resulting shaped article, and separating at least a substantial portion of the veil which supported said sheet from the rest of the veil to form a composite shaped article; and

(e) opening the press and removing the shaped article; performed in such a way that each step of the method is indexed to the previous step.

9. A method of conveying hot limp thermoplastic sheet compositions through an oven, to a press wherein the oven is maintained at a temperature above the melting point but below the decomposition temperature of the thermoplastic resin, which method comprises:

(a) heating said thermoplastic sheets in an oven to a tempera-

ture from about the melting point to a temperature below the decomposition temperature of the thermoplastic so that the thermoplastic is in a limp condition;

(b) providing a conveying surface comprised of a veil of non-woven material having a melting point substantially higher than that of the thermoplastic and capable of maintaining its chemical and physical integrity throughout the entire method wherein said veil is of indefinite length to support said thermoplastic sheets and convey them into position in a press between two components of a die;

(c) stopping movement of said veil when a thermoplastic sheet is positioned between two components of said die;

(d) actuating at least one component of said die to shape the sheet and veil thereby bonding said veil to the resulting shaped article, and separating at least a substantial portion of the veil which supported said sheet from the rest of the veil to form a composite shaped article; and

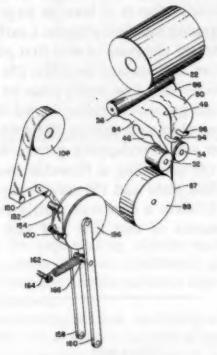
(e) opening the press and removing the shaped article; performed in such a way that each step of the method is indexed to the previous step.

4,181,552

MACHINE AND METHOD FOR FORMING A PLEATED AND WOUND ELECTRICAL CAPACITOR WITH A METALLIZED DIELECTRIC

Charles C. Rayburn, Mount Prospect, and Robert V. Enstrom, Oak Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 21, 1978, Ser. No. 898,583
Int. Cl.[2] B31F *1/34*
U.S. Cl. 156—204 **24 Claims**



1. A method of pleating continuously fed flexible sheet material with at least one creased pleat comprising the steps of pulling said sheet material under tension over a number of rotatable discs equal in number to the desired number of pleats of said sheet material so that one side of said sheet material is firmly locked onto the peripheries of said discs to initiate said pleats and passing said sheet material with said initiated, but not creased pleats, under tension around a portion of the periphery of a rotatable winding wheel so that said pleats are creased at the point where said sheet material initially contacts said wheel as a result solely of the tension applied to said flexible sheet material.

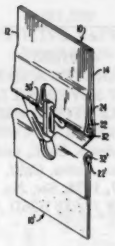
7. A machine for pleating continuously fed flexible sheet material with at least one creased pleat comprising supply means for supplying said sheet material, a number of rotatable discs over which said sheet material is pulled under tension, the number of said rotatable discs being equal to the desired number of creased pleats of said sheet material, so that one side of said sheet material is firmly locked onto the peripheries of said discs to initiate said pleats, and a rotatable winding wheel a portion of the periphery of which receives said pleated sheet material under tension with said initiated, but not creased pleats, so that said pleats are creased at the point where said sheet material initially contacts said wheel as a result solely of the tension applied to said flexible sheet material.

4,181,553

TWO COMPONENT REMOVABLE ADHESIVE HANGER

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodlettsville, Tenn.

Division of Ser. No. 739,938, Nov. 8, 1976, Pat. No. 4,106,741.
This application Apr. 13, 1978, Ser. No. 896,204
Int. Cl.[2] B32B *31/18*; A47F *7/14*; B32B *3/08*; B42F *1/00*
U.S. Cl. 156—211 **16 Claims**



1. A method of making a two component removable adhesive hanger for hanging an object on a wall or like surface comprising the steps of:

(a) forming a hook member having a hook portion;

(b) forming a hook support component;

(c) attaching said hook member to said hook support component;

(d) forming a backing sheet component of fibrous water disintegratable material having a water activated and water dissolvable adhesive on at least one side; and

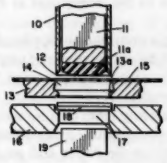
(e) adhesively attaching the hook support component to said backing sheet component.

4,181,554

METHOD OF APPLYING POLARIZED FILM TO LIQUID CRYSTAL DISPLAY CELLS

Dennis E. Rich, Riverton, Utah, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 6, 1978, Ser. No. 949,192
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—261 **10 Claims**



1. A method for applying a portion of polarized film to a surface of a liquid crystal display cell including the steps of:

providing a punch with a hollow open end having a perimeter of a predetermined shape with a cutting edge, and a die having an opening of said predetermined shape aligned with and spaced apart from said cutting edge;

moving a sheet of polarized film between said cutting edge of said punch and said opening of said die with said film having an adhesive surface facing said die;

moving said cutting edge of said punch through said sheet of

polarized film into said opening of said die to cut said portion of polarized film from said sheet;

catching and holding said portion of film by the perimeter thereof;

holding said liquid crystal cell with said surface lying directly beneath said held portion of polarized film;

moving a piston, that substantially fills said hollow open end of said punch and that has a flexible convex shaped tip, toward said held portion of film to deflect the center of said held portion of film against said surface; and

pressing said flexible tip against said deflected portion of film to force said portion against said surface with a rolling motion away from said center thereby eliminating the trapping of air bubbles between said portion of film and said surface.

4,181,555

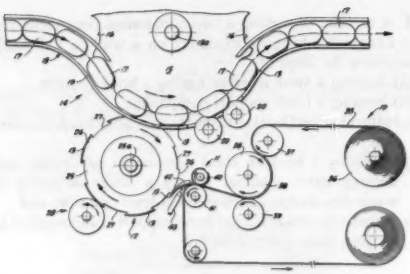
LABELING APPARATUS AND METHOD FOR CONTINUOUSLY SEVERING LABELS FROM CONTINUOUS LABEL STOCK AND APPLYING THE SEVERED LABELS TO CONTAINERS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Feb. 7, 1978, Ser. No. 875,891

Int. Cl.[2] B32B *31/00*; B26D *5/00, 7/06*

U.S. Cl. 156—265 **11 Claims**



1. Apparatus for continuously labeling containers with printed labels severed from continuous label stock, including portions lying outside the printed labels, said apparatus comprising:

(a) a container feed for continuous supply of containers to, through and from a label applying station

(b) a label transfer means for picking up labels in sequence at a label receiving station and transferring the labels to the label applying station

(c) said container feed and transfer means acting to supply labels in sequence to the containers at the label applying station

(d) means providing a continuous supply of continuous label stock printed with labels, portions of said label stock being located outside the areas of the printed labels and constituting scrap material and

(e) continuously operating label cutting means in the form of a single pair of contiguous, cylindrical, parallel rollers consisting of a driven die roller and an anvil roller, such die roller having formed on its cylindrical surface at least one cutting die which during each revolution of the die roller comes into tangent contact with the anvil roller and with label stock fed between the rollers, the shape and size of the cutting die being such as to sever from the label stock passing between the two rollers a complete label separated from the portion or portions of label stock lying outside the printed labels, said rollers being spaced from and separate from said label transfer means and being so located as to move each label as it is severed away from and out of contact with the two rollers and toward said label transfer means.

4,181,556

COMPOSITE PANEL MATERIALS AND METHOD OF MANUFACTURE

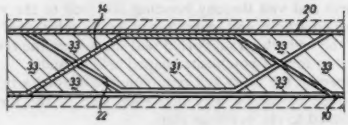
Hans-Beat Fehlmann, Walchwil, Switzerland, assignor to Loewe Anstalt, Bergstrasse, Switzerland

Division of Ser. No. 744,263, Nov. 23, 1976, Pat. No. 4,139,670. This application Oct. 12, 1978, Ser. No. 950,577

Claims priority, application Switzerland, Nov. 24, 1975, 15173/75

Int. Cl.[2] B32B *3/30, 3/28*

U.S. Cl. 156—292 **7 Claims**



1. A method of manufacturing a composite panel material comprising the steps of (1) providing a first and a second metal plate each having at least one group of substantially isomorphous bridge-shaped elements having each a longitudinal dimension and a lateral dimension and protrudingly extending from said plate, said group of bridge-shaped elements extending in a main direction substantially vertical to said longitudinal dimension of said bridge-shaped elements constituting said group, said bridge-shaped elements of said group being arranged with their longitudinal dimensions substantially parallel to each other, each two adjacent bridges of said group being separated by a distance that is at least as large as said lateral dimension; (2) arranging said first plate on a surface member so that said bridge-shaped elements of said first plate extend in a direction away from said surface member; (3) arranging said second metal plate on said first metal plate so as to overlappingly intermesh said groups of bridge-shaped elements of said first and said second plate such that an elongate cage structure is formed between said overlapping groups of said bridge-shaped elements; (4) providing a flowable matrix precursor material on said first plate and (5) solidifying said flowable matrix precursor to form a coherent matrix embedding said bridge-shaped elements of said first and said second metal plate.

4,181,557

BONDING METHOD EMPLOYING WATER-ACTIVATABLE ADHESIVE COMPOSITIONS COMPRISING A PLASTICIZER AND AN N-SULFOHYDROCARBON-SUBSTITUTED ACRYLAMIDE POLYMER

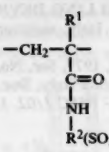
Roger H. Doggett, Natick, and Henry L. Buccigross, Needham, both of Mass., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 476,014, Jun. 3, 1974, Pat. No. 4,136,078, which is a continuation of Ser. No. 302,339, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 145,945, May 21, 1971, abandoned. This application Jul. 10, 1978, Ser. No. 923,131

Int. Cl.[2] C09J *5/02*

U.S. Cl. 156—331 **6 Claims**

1. A method for adhering surfaces which comprises heating an adhesive composition to form a melt, applying said melt to at least one of the surfaces to be adhered, allowing said adhesive composition to cool, moistening said adhesive composition and contacting the same with the other surface; said adhesive composition comprising a plasticizer and at least one polymer containing units of the formula



wherein R^1 is hydrogen or a lower alkyl or substituted lower alkyl radical; R^2 is a divalent or trivalent hydrocarbon or substituted hydrocarbon radical; M is hydrogen or one equivalent of a cation; and x is 1 or 2.

4,181,558

METHOD AND DEVICE FOR THE TAPE-SEALING OF PANELS OF PAPER, CARDBOARD, PLASTIC, OR WOOD, AND ADHESIVE TAPE THEREFOR

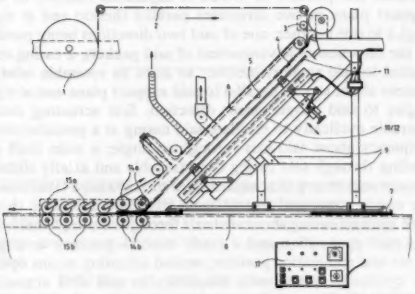
Rolf Neubronner, 6246 Glashutten, Zum Talblick 64, Fed. Rep. of Germany

Continuation of Ser. No. 594,260, Jul. 9, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,771

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1974, 2432895

Int. Cl.² B32B *31/00*

U.S. Cl. 156—355 **15 Claims**



1. A device for tape-sealing objects such as boxes, box blanks, or webs, made of paper, cardboard, plastic, wood, and the like, with a heat-activatable adhesive tape the device comprising in combination:

an adhesive activating station, including a heatable activating zone and a heat source capable of heating the activating zone to a temperature sufficient to activate the adhesive tape;

a joining station at which moving strips of adhesive tape of predetermined length meet moving objects of the above-mentioned kind serve as a substrate for said tape strips, when joined; the joining station being spaced a distance from said activating zone;

means for paying out a succession of said adhesive tape strips from an adhesive tape supply;

means associated with said tape payout means for conveying a succession of said tape strips through said activating station to said joining station in response to the conveying of said succession of objects to the joining station;

means for synchronously conveying a succession of said objects to the joining station;

means for applying a heat-activated adhesive tape strip to each of said objects in the joining station, thereby cooling and curing the adhesive upon contact;

wherein said adhesive tape payout means includes a supply roll, an interruptable tape payout drive and tape cutting means; wherein the tape strip conveying means includes a tape strip carrying member moving toward the joining station and subjected to suction, so as to be capable of holding the tape strip against the carrying member with their adhesive layer facing away from the carrying member; wherein the heat source faces the adhesive layer of the tape strips on the moving carrying member in said activating zone, so as to directly transmit heat to the adhesive layer across a gap between the tape strips and the heat source; wherein the heat source is an infrared heater which radiates heat against the adhesive layer of the tape strips on the carrying member; and

wherein the adhesive activating station further includes means for selectively interrupting the heat transmitting action of said heater, through the interposition of a screen between the heater and the adhesive activating zone.

4,181,559

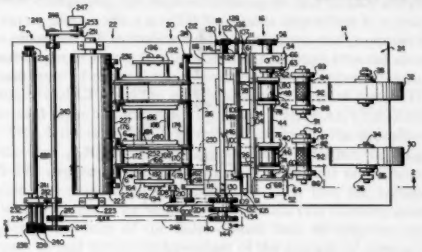
PRESSURE SENSITIVE TAPE APPLICATOR APPARATUS

William S. Hudson, 2640 Reed St., N.E., Washington, D.C. 20018

Filed Feb. 16, 1978, Ser. No. 878,439

Int. Cl.² B32B *35/00, 31/00*

U.S. Cl. 156—389 **11 Claims**



1. An apparatus for sequentially applying predetermined lengths of pressure sensitive tape onto a continuous web of flexible material in spaced relationship wherein the tape comprises a double-sided adhesive tape with a lift-off backing member contacting one of the sides of the adhesive tape and having a width slightly greater than the width of the double-sided adhesive tape to leave on opposed edges of the backing member areas devoid of the adhesive tape, the combination comprising:

first means for supporting a continuous web of flexible material;

second means, engaging the continuous web, for feeding the continuous web past a predetermined tape-applying position;

third means for supporting a continuous strip of pressure sensitive tape;

fourth means, located downstream of said third means, for sequentially cutting the continuous strip of pressure sensitive tape into predetermined lengths;

fifth means, located downstream of said third means, for feeding the continuous strip to said fourth means for cutting;

sixth means for sequentially conveying the cut predetermined lengths in spaced relationship from said fourth means for cutting into adhering contact with the continuous web of flexible material at said predetermined position;

said sixth means comprising

endless conveyor means contacting the side of the backing member opposite the side contacting the double-sided adhesive tape, and

two thin endless belt conveyors overlying said endless conveyor means and spaced apart a distance at least equal to the width of the double-sided adhesive tape,

said two thin endless belt conveyors contacting the side of

the backing member contacting the double-sided adhesive tape in the areas devoid of the adhesive tape;

said fourth means for cutting including a rotating housing and blade means supported on said housing; and

lubricating means, positioned adjacent said fourth means, for continuously lubricating said rotating housing and blade means during rotation.

4,181,560

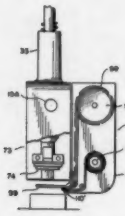
ELECTRO-MECHANICAL MARKING DEVICE

Roy Maitland, Laguna Niguel, Calif., assignor to Count Numbering Machine, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 714,010, Aug. 13, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,558

Int. Cl.[2] B41F *1/00*

U.S. Cl. 156—542 **12 Claims**



1. An electro-mechanical marking device, for use with a machine having a frame and a stack sheet feed assembly for which individual sheets are removed intermittently in succession to subsequently have the machine perform an insignia applying operation thereon, said machine further including a driven circular element that rotates as each of the individual sheets is removed from the stack sheet feed, said marking device including in combination:

a housing having an open lower end and a pair of slide guide means fixedly mounted to said housing at the open end thereof, each of said slide guide means being positioned on opposite sides of said housing and extending below said housing,

fastening means engageable with said housing for adjustably mounting the marking device to the machine above the stack sheet feed assembly, such that said slide guide means is positioned adjacent the uppermost sheet in the stack sheet feed assembly,

drive element means slidably supported from said housing,

electro-mechanical means mounted in said housing and engageable with said drive element to move the same from an at rest position to an extended actuated position,

interchangeable marking head means adapted to be loosely mounted to and received by said slide guide means in said open end of said housing and mounted to be engaged by said drive means, said marking head means having foot element means mounted thereon, such that upon the energization of said electro-mechanical means, said drive element means, said marking head means and said foot element means are moved from an at rest position to an extended actuating position whereby said foot element means engages the stack sheet feed and marking head means engages the upper-most sheet on the stack sheet feed to mark the same.

4,181,561

LABELLING DEVICE

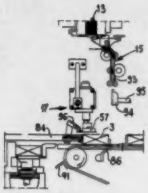
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Dec. 8, 1977, Ser. No. 858,632

Claims priority, application Italy, Dec. 13, 1976, 3610 A/76

Int. Cl.[2] B65C *1/02, 1/06*

U.S. Cl. 156—566 **3 Claims**



1. A labelling device, particularly for applying a label to packets, in particular cigarette packets of the hinged lid type, arranged flat on a support plane and advanced transversely thereabout in a step-by-step manner; the labelling device comprising a feeding device for feeding in succession individual labels to a take-up position; stop means for stopping in succession each said packet on said support plane in an application position at which the respective label is applied; a support member the position of which is adjustable relative to said support plane in two directions parallel thereto and at right angles to one another, one of said two directions being parallel to the direction of advancement of said packets; a casing connected to said support member so as to be rotatable relative thereto about an axis parallel to said support plane and at right angles to said advancement direction; first actuating means operable cyclically to oscillate said casing at a predetermined frequency about said axis through an angle; a main shaft extending through said casing in a rotatable and axially slidable manner and arranged at right angles to said axis; a label retaining means connected to said main shaft and oscillable therewith and said casing about said axis through said angle between said take-up position and a ready-to-work position arranged above said application position; second actuating means operable cyclically at the same frequency as said first actuating means to displace axially said label retaining means between said ready-to-work position and said application position; and transmission means adjustable between a coupled position and a decoupled position to transform, when arranged in said coupled position, the oscillation of said casing through said angle into a rotation of about 90° of said label retaining means about the axis of said main shaft.

4,181,562

LABELING MACHINE FOR BOTTLES AND THE LIKE

Rudolf Zodrow, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 900,688

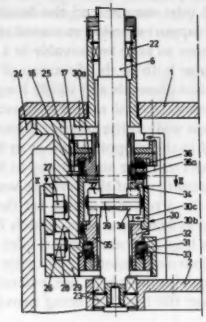
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730030

Int. Cl.[2] B65C *9/16;* **B65H** *3/20*

U.S. Cl. 156—568 **3 Claims**

1. In a labeling machine for bottles and the like having a revolving carrier on which at least one pickup element having an outwardly curved receiving surface for labels is rotatably and eccentrically mounted between the receiving surface and the center of the curvature thereof relative to the axis of rotation of the carrier, and having one drive for each pickup element including a stationary sun gear for all of the pickup elements, a drive spindle for each pickup element and a pinion therefor which meshes with the sun gear and is axially displaceable in relation to the sun gear, wherein the improvement comprises equalizing transmission means for coupling the drive

spindle of each pickup element with its associated pinion comprising first cam means having a cam surface of varying curvature driven by the pinion and a cam follower in contact with the cam surface to drive the drive spindle and second cam



means for axially displacing the pinion and a portion of the first cam means along the drive spindle to change the position of the cam follower on the cam surface of varying curvature to effect an acceleration or retardation of the rotary movement of the drive spindle.

4,181,563

PROCESS FOR FORMING ELECTRODE PATTERN ON ELECTRO-OPTICAL DISPLAY DEVICE

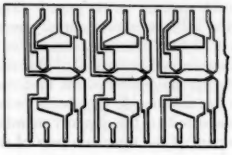
Kenji Miyaka, Kunitachi, and Hisao Noro, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 890,909

Claims priority, application Japan, Mar. 31, 1977, 52-36595; Jan. 26, 1978, 53-7676

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—643 **7 Claims**



1. A process for forming an electrode pattern on an electro-optical display device having a substrate comprising the steps of:

(a) forming a transparent semi-electrode pattern having adjacent segments connected to each other said forming including the step of

(b) applying a transparent conductive film of indium oxide on one side of the substrate; and

(c) applying a laser ray having a wavelength greater than 0.6 μm to a selected area between the segments of said semi-electrode pattern to remove said transparent conductive film thereby forming a non-conductive area at said selected area.

4,181,564

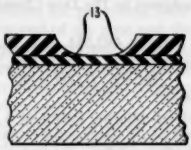
FABRICATION OF PATTERNED SILICON NITRIDE INSULATING LAYERS HAVING GENTLY SLOPING SIDEWALLS

Thomas N. Fogarty, Allentown; William R. Harshbarger, Bethlehem, and Roy A. Porter, Whitehall, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1978, Ser. No. 899,535

Int. Cl.[2] H01L *21/285, 21/306*

U.S. Cl. 156—643 **12 Claims**



10. In a method for fabricating semiconductor integrated circuits, a method for fabricating multilevel structures on a surface comprising the steps of forming on said surface a layer of $Si_{0.7-1.3}N_{0.7-1.3}H_{0.3-0.7}$ **(12)** by plasma deposition in a reaction chamber **(20)** including a mixture of silane and ammonia in a carrier gas of argon, forming openings through selected areas of said layer of plasma etching in a reaction chamber including a mixture of CF_4 and O_2, and depositing a layer of metal **(17)** over said layer including said openings, CHARACTERIZED IN THAT the temperature of the surface during the deposition of the $Si_{0.7-1.3}N_{0.7-1.3}H_{0.3-0.7}$ layer is initially within the range 330–375 degrees C. and is decreased to a final temperature within the range 270–325 degrees C. such that the etching produces openings having sloped sidewalls **(13)** forming acute angles at the base of the layer of less than 60 degrees with respect to said surface independent of the amount of overetching of the layer.

4,181,565

PROCESS FOR COOKING LIGNOCELLULOSIC MATERIAL IN THE PRESENCE OF HYDROXYANTHRACENES AND DERIVATIVES THEREOF

Masato Nakamura; Yoshika Nomura, both of Tokyo, and Iwahiro Uchimoto, Chiba, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 758,837, Dec. 2, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,582

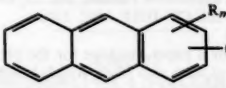
Claims priority, application Japan, Dec. 10, 1976, 51-148492

Int. Cl.[2] D21C *3/20*

U.S. Cl. 162—76 **18 Claims**

1. An improved cooking process for the production of pulp from lignocellulosic material comprising cooking lignocellulosic material in a cooking liquor,

the improvement comprising admixing in said cooking liquor an amount, sufficient to increase the cooking rate of said lignocellulosic material, of a cooking aid comprising at least one member selected from the group consisting of compounds having the formula:



wherein m is 0, 1 or 2, n is 1 or 2, R is COOA, SO_3A or H, and A is H or Na; providing that

when m is 1, R is at least one of COOA or SO_3A and R cannot attach to the middle ring;

when m is 0 or 2, R is H; and

when R is H and m is 2, two carbon atoms of the anthracene nucleus lose their double bonds, and each such carbon

atom takes the form of CH_2 instead of CH, in which case one H of each CH_2 is not counted as an R and may be substituted by OA.

4,181,566

CELLULOSIC MATERIALS INTERNALLY SIZED WITH AMMONIATED ACID COPOLYMERS AND EPIHALOHYDRIN/ALKYLAMINE REACTION PRODUCTS

Walter L. Vaughn, Lake Jackson, and James A. Allen, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 497,581, Aug. 15, 1974, abandoned. This application May 7, 1976, Ser. No. 684,223

Int. Cl.[2] D21H *3/40*

U.S. Cl. 162—164 EP **14 Claims**

1. In a method for internal sizing of a cellulosic material wherein an internal sizing agent and a retention aid are applied to the fibers of the cellulosic material, the improvement wherein the internal sizing agent is a water-dispersible, water- and alkali-insoluble copolymer of an α,β-ethylenically unsaturated hydrophobic monomer and an ammoniated α,β-ethylenically unsaturated carboxylic acid and the retention aid is a water dispersible reaction product of epihalohydrin and an alkylamine or a mixture of an alkylamine and ammonia wherein the alkylamine has at least two amine hydrogens.

4,181,567

PAPER MANUFACTURE EMPLOYING FILLER AND ACRYLAMIDE POLYMER CONGLOMERATES

Martin C. Riddell, 15 Nurseries Rd., Kidlington, Oxfordshire, England, and Ian M. Waring, Johannesburg, South Africa, assignors to Martin Clark Riddell, Kidlington, England

Continuation of Ser. No. 703,795, Jul. 9, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,625

Claims priority, application United Kingdom, Jul. 17, 1975, 30127/75

Int. Cl.[2] D21D *3/00*

U.S. Cl. 162—168 NA **14 Claims**

1. A method of manufacturing paper sheet from cellulose pulp on a papermaking machine which permits an increase in the filler content of the paper sheet, in both acidic and alkaline papermaking systems, without any substantial loss in strength, comprising: forming modified mineral filler conglomerates by contacting an aqueous suspension of a particulate mineral filler with a polymer of acrylamide having a zeta potential in the range of from -40 to $+40$ electron volts and a molecular weight in the range of from 2×10^6 to 20×10^6, and incorporating the mineral filler conglomerates into the cellulose pulp prior to feeding the cellulose pulp containing the conglomerates to a continuous wire mesh at the wet end of the papermaking machine.

4,181,568

HEADBOX FOR A PAPER MACHINE FOR THE PRODUCTION OF A FIBER WEB OF AT LEAST TWO PLIES

Johan v. Pfaler, Nokia, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed May 30, 1978, Ser. No. 911,012

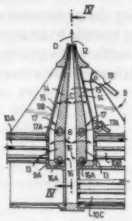
Claims priority, application Finland, Jul. 13, 1977, 772184

Int. Cl.[2] D21F *1/02, 1/06*

U.S. Cl. 162—343 **14 Claims**

1. A headbox for a paper machine for the production of a fiber web having at least two plies, which headbox defines a slice chamber, at least first and second inlet means for admitting respective fiber suspensions to the slice chamber, and an elongated slice opening which, in use, extends across a wire of the paper machine, the headbox being provided with at least one division wall which is substantially platelike and is disposed within the slice chamber substantially parallel to the longitudinal direction of said slice opening to divide the slice chamber into at least first and second separate slice channels through which the respective fiber suspensions admitted by the first and second inlet means pass to the slice opening as streams of width substantially equal to that of the wire and leave the slice chamber to form on the wire a web of at least two plies formed respectively by the fiber suspensions admitted by the first and second inlet means, and the headbox further being provided with a support member mounted at the upstream end of the slice chamber so as to be movable in a direction substantially perpendicular both to the direction of flow of fiber suspensions in the slice channels and to the longitudinal direction of the slice opening, pivotal means connecting the upstream end of the division wall to the support member, and adjusting means connected to the support member to bring about movement of the support member and thereby to bring about movement of the upstream end of the division wall.

8. A headbox for a paper machine for the production of a fiber web having at least two plies, which headbox defines a slice chamber, at least first and second inlet means for admitting respective fiber suspensions to the slice chamber, and an elongated slice opening which, in use, extends across a wire of the paper machine, the headbox being provided with at least



one division wall which is substantially platelike and is disposed with the slice chamber substantially parallel to the longitudinal direction of said slice opening to divide the slice chamber into at least first and second separate slice channels through which the respective fiber suspensions admitted by the first and second inlet means pass to the slice opening as streams of width substantially equal to that of the wire and leave the slice chamber to form on the wire a web of at least two plies formed respectively by the fiber suspensions admitted by the first and second inlet means, and the headbox further being provided with a support member mounted at the upstream end of the slice chamber, and wherein said division wall comprises a downstream part and an upstream part to which the downstream part is connected and which is secured to said support member in such manner as to permit displacement of said upstream part in a direction substantially perpendicular both to the direction of flow of fiber suspensions in the slice channels and to the longitudinal direction of the slice opening while preventing pivotal movement of the upstream part within the headbox, and the headbox further being provided with adjusting means connected to the support member to bring about such displacement of the upstream part of the division wall.

4,181,569

NUCLEAR REACTOR CONTROL

Robert V. Ingham, Knutsford, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 24, 1977, Ser. No. 780,809

Claims priority, application United Kingdom, Apr. 13, 1976, 15136/76

Int. Cl.[2] G21C *7/08*

U.S. Cl. 176—36 R **4 Claims**

1. A nuclear reactor having a reactivity control system comprising: at least one control rod of neutron absorbing material arranged for vertical displacement between a first fixed operable position wherein the neutron absorbing material is disposed above the reactor core and a variable second opera-

ble position wherein the neutron absorbing material is disposed within the core, means for monitoring an operating parameter of the core and initiating a trip signal in response to a predetermined condition, a fixed first latching device for securing the control rod in the first operable position, the device being responsive to the monitoring means whereby on initiation of a trip signal the device can release the control rod, a second

latching device for variably arresting fall of the control rod in the variable second operable position, and means for adjusting the variable second operable position relative to the reactor core while said rod is held by either of said first and second latching devices, the adjusting means being responsive to reactivity within the reactor core, whereby the initial position of arrest of a released rod and subsequent controlled insertion in the reactor core can be varied.

4,181,570

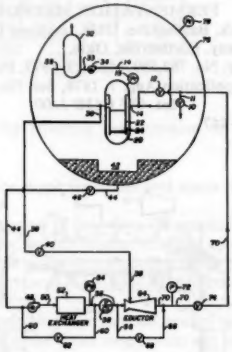
POST-LOCA CORE FLUSHING SYSTEM

John D. Boyajian, Windsor, and Paul A. Weinberger, Bloomfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 17, 1976, Ser. No. 667,731

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **9 Claims**



1. In a nuclear-reactor system that has a primary coolant circuit for circulating fluids, the primary coolant circuit having a first part comprising a primary heat-removal means and a primary motivating means and a second part comprising a fuel-containing core, means for providing fluid communication between a first end of the core and a first end of the first part of the primary coolant circuit, and means for providing fluid communication between a second end of the core and a second end of the first part of the primary coolant circuit, which nuclear-reactor system further comprises a sump for collecting liquid and a containment structure, having an interior, for preventing escape to the outside atmosphere of material from the coolant circuit, an apparatus for emergency cooling of the core, comprising:

a. an eductor having a motivating inlet, a suction inlet, and an outlet, the means for providing fluid communication between the first end of the core and the first end of the first part of the primary coolant circuit being connected to the suction inlet for fluid communication therewith, the eductor thereby being arranged to draw fluid from the primary coolant circuit;

b. means for selectively providing fluid communication between the outlet of the eductor and the interior of the containment structure;

c. means for selectively providing fluid communication between the outlet of the eductor and the second end of the core; and

d. a pump having an inlet and an outlet, the inlet being connected to the sump for fluid communication therewith and the outlet being connected to the motivating inlet of the eductor for fluid communication therewith.

4,181,571

NUCLEAR REACTOR WITH FUEL PIN BRACING GRID

Robert Jolly, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 22, 1978, Ser. No. 935,805

Claims priority, application United Kingdom, Sep. 9, 1977, 37772/77

Int. Cl.[2] G21C *3/18, 1/02*

U.S. Cl. 176—40 **4 Claims**

1. A fuel pin bracing grid for a nuclear fuel sub-assembly, the grid comprising a plurality of strips formed to produce a complex of hexagonally shaped unit cells in honeycomb pattern, each cell being formed from a discrete strip of material, each of three alternate sides of the cell having an opening formed therein and the remaining sides being continuous, each continuous side having an embossment to provide a guide pad for a fuel pin.

4,181,572

CLOSURE HEAD FOR A NUCLEAR REACTOR

Elman E. Wade, South Huntingdon, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 806,972

Int. Cl.[2] G21C *13/06;* E06B *7/16;* B65D *53/00*

U.S. Cl. 176—87 **14 Claims**

1. A closure head for a nuclear reactor comprising:

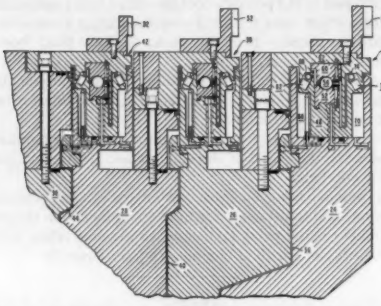
a stationery outer ring disposed on a reactor vessel;

a first rotatable plug disposed within said stationery outer ring defining a first annulus therebetween for enclosing internals of said reactor vessel and for positioning refueling equipment;

a first bearing assembly mounted in said stationery outer ring and in contact with said first rotatable plug for supporting said first rotatable plug from said stationary outer ring;

first seal means disposed in said first annulus for preventing passage of gases through said first annulus;

first biasing means mounted on said stationery outer ring and near said first seal means for selectively contacting said



first seal means and urging said first seal means into contact with said first rotatable plug thereby sealing said first annulus; and

first fluid means connected to said first annulus near said first bearing assembly for introducing a fluid into said first annulus and into contact with said first seal means causing said first seal means to compress said first biasing means and allowing said fluid to pass over said first seal means while forming a fluid layer between said first seal means and said first rotatable plug thereby sealing said first annulus.

4,181,573

PROCESS FOR THE PRODUCTION OF ANTIBIOTIC X-14547

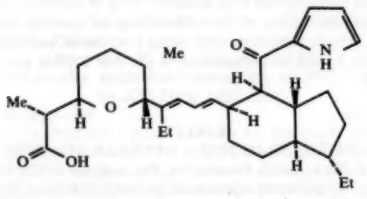
John Westley, Clifton, and Chao-Min Liu, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 712,286, Aug. 6, 1976, Pat. No. 4,100,171. This application Apr. 20, 1978, Ser. No. 898,052

Int. Cl.[2] C12D *9/00*

U.S. Cl. 435—119 **1 Claim**

1. A process for the production of the antibiotic X-14647 having the following formula



which comprises cultivating a strain of Streptomyces sp. X-14547, NRRL·8167, in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the X-14547 antibiotic from said solution.

4,181,574

PRODUCTION OF ANTIBIOTICS BY FERMENTATION OF NOVEL STRAINS OF *MICROPOLYSPORA CAESIA*

Hiroshi Kawaguchi, Tokyo; Hiroshi Tsukiura, Mitaka, and Koji Tomita, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 841,242, Oct. 11, 1977, which is a continuation-in-part of Ser. No. 815,329, Jul. 13, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,200

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—77 **7 Claims**

1. A microbiological process for the preparation of a mixture of the antibiotics Bu-2313A and Bu-2313B which comprises cultivating a strain of *Micropolyspora caesia* having the identifying characteristics of A.T.C.C. 31295, 31296, 31297 or 31298 under submerged aerobic conditions in an aqueous culture medium containing assimilable sources of carbon and nitrogen until a substantial amount of said antibiotic mixture is produced by said microorganism in said culture medium.

4,181,575

COMPOSITION AND METHOD FOR THE DETERMINATION OF CHOLESTEROL

Wolfgang Gruber, Tutzing-Unterzeismering; Gunter Lang; Michael Nelboeck-Hochstetter, both of Tutzing; Peter Röeschlau, Seeshaupt; Hans Seidel, Tutzing, and Detlef von Hoerschelmann, Wielenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 842,001

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649749

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—11 **13 Claims**

1. In a cholesterol assay wherein a sample suspected of containing bound cholesterol is treated with cholesterol esterase to liberate cholesterol and the liberated cholesterol is subsequently or simultaneously measured by its enzymatic conversion to cholesterase using a cholesterol reacting enzyme, the improvement comprises using as the cholesterol reacting enzyme a NAD- or NADP-dependent cholesterol dehydrogenase obtained from either an anaerobic microorganism or from a mammalian liver.

9. Composition for the determination of total or bound cholesterol which comprises cholesterol esterase and NAD- or NADP-dependent cholesterol dehydrogenase and a buffer.

4,181,576

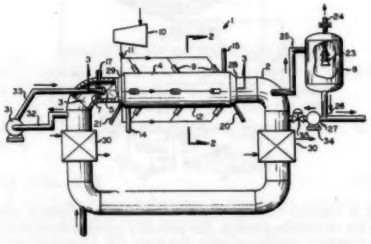
FERMENTATION METHOD

Emil A. Malick, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 782,599, Mar. 29, 1977, Pat. No. 4,148,691. This application Aug. 7, 1978, Ser. No. 931,636

Int. Cl.[2] C12B *1/00*

U.S. Cl. 435—247 **7 Claims**



1. A method of conducting fermentation in a loop flow type fermentation apparatus having a flow path in and defined by a

tubular member forming a substantially continuous loop having a nozzle and an outlet to a pressurizing means, comprising the steps of

(a) flowing medium along said flow path in and defined by said tubular member forming said substantially continuous loop;

(b) removing a portion of said medium from said flow path via said outlet upstream of said nozzle;

(c) pressurizing the thus removed medium in said pressurizing means;

(d) atomizing the thus pressurized medium into small drops by discharging said pressurized medium into said flow path through said nozzle;

(e) introducing assimilable oxygen adjacent said nozzle for mixing with the thus atomized medium and thereby forming a mixture;

(f) removing heat from the resulting mixture as said mixture flows along at least a portion of said flow path;

(g) mixing said mixture as it flows along at least a portion of said flow path;

(h) withdrawing a portion of the thus mixed mixture from said flow path at a point upstream of said outlet and separating the thus withdrawn portion into a gas phase and a liquid phase.

4,181,577

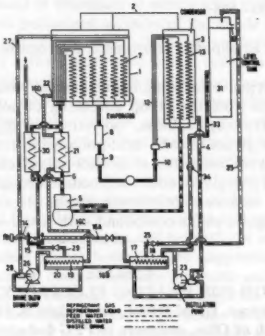
REFRIGERATION TYPE WATER DESALINISATION UNITS

Norman L. Foley, Modbury North, Australia, assignor to Auscoteng Pty. Ltd., Rose Park, Australia

Continuation-in-part of Ser. No. 597,448, Jul. 21, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,125

Int. Cl.[2] B01D *3/06, 3/10*

U.S. Cl. 202—181 **1 Claim**



1. Apparatus for effecting desalinisation of saline water comprising:

an evaporator,

supply means for supplying saline feed water to said evaporator,

a condenser disposed in fluid flow communication with the evaporator for flow of vapour from the upper portion of the evaporator to the upper portion of the condenser,

means to supply heat to the evaporator and extract heat from the condenser,

said means comprising a refrigerant system having its condensing coils in the water evaporator, and its evaporative coils in the water condenser,

a distillation extraction pump circulating distillate in a closed system to the inlet of the pump through an entrainment chamber into which chamber the distillate from the lower portion of the condenser is drawn, this entrainment of the distillate also producing a vacuum through the condenser into the evaporator to cause flow of vapour from the evaporator to the condenser,

said distillation extraction pump being connected to a supply of distillate at a higher level than said condenser coils,

said connection including a valve whereby the condenser coils in said condenser can be selectively flooded during startup to provide a heat sink to prevent icing of the condenser coils,

a brine extraction pump circulating extracted brine in a closed system to the inlet of the brine extraction pump through an entrainment chamber into which the brine extracted is drawn, this entrainment of the brine being taken from an upper level of the evaporator to maintain the level of the water in the evaporator and assist in maintaining the vacuum therein,

said pumps maintaining a high degree of vacuum to cause boiling of the water at temperatures slightly above ambient temperature.

4,181,578

LEVELING BAR FOR COKE OVENS

Donald R. Stauffer, Baltimore, and Rolf Stuenes, Dundalk, both of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 29, 1978, Ser. No. 947,138

Int. Cl.[2] C10B *37/02, 31/00*

U.S. Cl. 202—239 **9 Claims**

1. A leveling bar comprising:

(a) a first upstanding longitudinally extending side member having a first side surface;

(b) a second upstanding longitudinally extending side member having a second side surface;

(c) said first and second side surfaces in opposed facing relation, and said first side surface inclined upwardly toward said second side surface;

(d) a plurality of upstanding transversely extending cross plates between said first and said second side members each cross plate having a substantially vertical front and back surface;

(e) each pair of cross plates and side members therebetween forming a coal receiving pocket having a top and bottom opening, with said bottom opening larger than said top opening to minimize arching of coal within said pocket; and

(f) a leveling head means on one end of said leveling bar for first contacting coal in a coke oven during leveling.

4,181,579

SODIUM ION CONDUCTING SODIUM ALUMINUM PHOSPHATE GLASSES

Charles L. Booth, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,916

Int. Cl.[2] H01M *6/20*

U.S. Cl. 204—1 R **29 Claims**

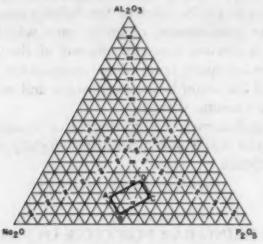
1. Method comprising electrically conducting sodium ions through a glass whose components lie within the area of the quadrilateral ABCD of the Na_2O, Al_2O_3 and P_2O_5 ternary phase diagram of FIG. 1 where the points A, B, C and D are defined by the following mole percentages:

	Na_2O	Al_2O_3	P_2O_5
A	53	13	34
B	53	5	42
C	36	13	51

-continued

	Na_2O	Al_2O_3	P_2O_5
D	36	21	43

the mole percent of the components within the quadrilateral totaling 100%, said glass containing 0 to 11 mole percent of an



oxide component selected from the group consisting of ZrO_2, MgO and SiO_2.

4,181,580

PROCESS FOR ELECTRO-TIN PLATING

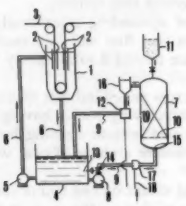
Minoru Kitayama; Takao Saito, and Ryousuke Wake, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 794,711, May 9, 1977, abandoned, which is a continuation of Ser. No. 628,770, Nov. 4, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,198

Claims priority, application Japan, Nov. 28, 1973, 48132794

Int. Cl.[2] C25D *3/30, 5/04, 21/15, 17/00*

U.S. Cl. 204—28 **11 Claims**



1. In a process for the electrolytic tinning of steel strip to produce tin plate wherein insoluble anodes are used and the steel strip as the cathode are immersed in an electrolysis bath vessel, the bath being composed of an acidic electrolyte solution containing stannous ions, whereby the stannous ions in the solution are consumed and tin is plated onto the strip, the improvement which comprises, replenishing and controlling the stannous ion concentration of the solution by contacting the solution exterior of the vessel with a bed of particulate elemental tin while simultaneously introducing an oxygen containing gas to said solution in a manner so as to provide a sufficient amount of dissolved oxygen in the solution in contact with the particulate tin to dissolve said tin into said solution at a rate sufficient to make up for the loss of stannous ions due to the plating-out thereof and circulating the thus contacted solution back to the vessel at a rate sufficient to minimize the deviations of the stannous ion concentration in the bath from the desired value.

4,181,581

ACRYLONITRILE BLOCK-COPOLYMER COMPOSITION

Hiroshi Iwata; Takeiji Ohtani; Seiichi Arakawa, and Seiji Deguchi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1978, Ser. No. 964,651

Claims priority, application Japan, Nov. 29, 1977, 52-143013

Int. Cl.[2] C08L *51/00, 53/00*

U.S. Cl. 260—42.48 **6 Claims**

1. An acrylonitrile polymer composition comprising an admixture of

(I) 30 to 80 weight % of an acrylonitrile polymer containing at least 40 weight % acrylonitrile;

(II) 10 to 80 weight % of a chlorine containing polymer derived from an ethylenically unsaturated monomer having a chlorine content of at least 20 weight %; and

(III) 0.5 to 10 weight % of an A-B block copolymer in which B is acrylonitrile and A is a monomer copolymerizable with monomer B.

4,181,582

GALVANIC ACID COPPER BATH AND METHOD

Wolfgang Dahms, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,746

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1977, 2746938

Int. Cl.[2] C25D *3/38*

U.S. Cl. 204—52 R **10 Claims**

1. A galvanic acid copper bath, comprising a standard aqueous bath of a copper salt and mineral acid and added thereto

(a) an amide of the general formula

$$R—CO—NH_2,$$

where R is an aliphatic or aromatic hydrocarbon monomer or polymer;

(b) an oxygen-containing, high molecular weight compound selected from the group consisting of polyvinylalcohol, carboxymethylcellulose, polyethylene glycol, polypropylene glycol, stearic acid-polyglycol ester, oleic acid-polyglycol ester, stearyl alcohol-polyglycol ether, nonylphenyl polyglycol ether, octanediol through polyalkylene glycol ethers and polyoxypropylene glycol; and

(c) an organic sulfur compound with water-soluble groups.

4,181,583

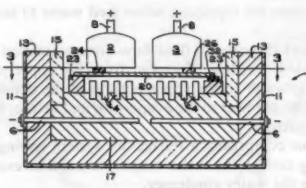
METHOD FOR HEATING ELECTROLYTIC CELL

Roger A. Steiger, Canal Fulton, and Calvin B. Holden, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 6, 1978, Ser. No. 966,836

Int. Cl.[2] C25C *3/06, 3/16, 3/26, 3/34*

U.S. Cl. 204—67 **24 Claims**



1. A method for controllably heating internal elements of an electrolytic cell for the production of metal to a desired temperature while avoiding objectionable thermal stress in such internal elements, which comprises placing a non-metallic

resistance heater having a positive change in resistivity with temperature within said cell, connecting said heater to a source of electric current, passing sufficient current through the resistance heater to heat said heater to at least said desired electrolytic cell temperature, and continuing to pass current through said heater at least until the internal elements of the cell reach the desired temperature.

2. The method of claim 1 wherein the electrolytic cell is an electrolytic cell for the production of aluminum.

4,181,584

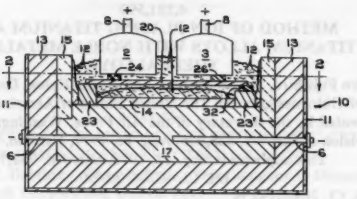
METHOD FOR HEATING ELECTROLYTIC CELL

Roger A. Steiger, Canal Fulton, and Calvin B. Holden, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 966,836, Dec. 6, 1978. This application Feb. 1, 1979, Ser. No. 8,311

Int. Cl.[2] C25C *3/06, 3/16, 3/26, 3/34*

U.S. Cl. 204—67 **21 Claims**



7. A method of heating an electrolytic cell for the production of aluminum by electrolysis of a molten electrolyte comprising a compound of aluminum in which solid electrolyte is disposed between juxtaposed surfaces of the anode and cathode of the electrolytic cell, said cell having vertically adjustable anodes and a floor and walls which define a chamber adapted to contain molten electrolyte, said floor being electrically conductive, which method comprises providing at least one pair of substantially vertical supporting blocks in and through the solid electrolyte, at least one of each of said pair of supporting blocks being electrically conductive, said supporting blocks being spaced a predetermined distance apart to position at least one anode therebetween and of sufficient height to extend from the floor of the cell to at least the level of solid electrolyte present in the cell beneath the anode, disposing a resistance heater between said supporting blocks, establishing electrical contact between the anode and the resistance heater, passing sufficient current through the resistance heater to raise the temperature of the heater to at least the melting temperature of the electrolyte, and continuing to pass current through said heater until electrolyte in the cell has melted, thereby heating the cell.

4,181,585

ELECTRODE AND METHOD OF PRODUCING SAME

Robert J. Pangborn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 3, 1978, Ser. No. 921,688

Int. Cl.[2] C25B *1/16, 1/26, 11/10, 11/12*

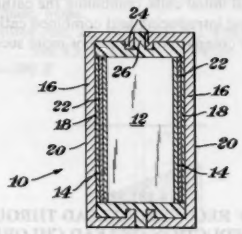
U.S. Cl. 204—98 **18 Claims**

1. An electrode comprising:

an electroconductive graphite substrate with at least a portion of the surface thereof being a solderable metal;

said electroconductive substrate being abuttingly joined to a film-forming metal foil by non-ferrous metal soldering the solderable metal surface of said substrate to the inner surface of said film-forming metal foil;

said film-forming metal foil with at least the soldered portion of the inner surface thereof being a solderable metal, the outer surface of said film-forming metal foil corresponding to at least a portion of the working area of the electrode, at least a portion of said outer surface being electrocatalytically active.



4,181,586

CATHODE ELECTROCATALYST

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 19, 1978, Ser. No. 916,637

The portion of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] C25B *1/46, 11/04*

U.S. Cl. 204—98 **14 Claims**

1. An electrode having a substrate with a film thereon comprising cobalt, tungsten, and phosphorous; said film being prepared by the method comprising depositing cobalt, tungsten, and phosphorous onto said substrate and thereafter heating said substrate to between 400° C. and 600° C. for at least about 24 hours whereby to oxidize cobalt to the +3 oxidation state; and said film having:

(a) a first portion in contact with said substrate; and

(b) a second portion atop said first portion, being more porous than said first portion, and having acicular filaments extending outwardly therefrom.

4,181,587

PROCESS FOR PRODUCING CHLORINE AND CAUSTIC SODA

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Dec. 7, 1978, Ser. No. 967,190

Int. Cl.[2] C25B *1/16, 1/26*

U.S. Cl. 204—98 **1 Claim**

1. In a process for producing chlorine and caustic soda in a bank of a plurality of electrolytic cells each having an anode compartment and a cathode compartment separated from each other by a cationic permeable membrane and wherein caustic soda catholyte produced in a first cathode compartment is passed serially to the cathode compartment of one or more succeeding cells, the improvement which comprises maintain-

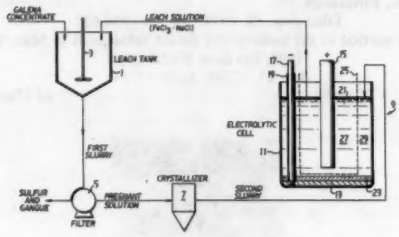
ing at least two of the initial cells in the bank in parallel catholyte flow by introducing water into the cathode compartment of each of said initial cells, withdrawing caustic soda catholyte from each of said initial cells, combining the catholyte streams so withdrawn and introducing said combined catholyte stream into the cathode compartment of one or more succeeding cells in the bank.

4,181,588

METHOD OF RECOVERING LEAD THROUGH THE DIRECT REDUCTION OF LEAD CHLORIDE BY AQUEOUS ELECTROLYSIS

Morton M. Wong, and Frank P. Haver, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 4, 1979, Ser. No. 1,026
Int. Cl.[2] C25C *1/18*
U.S. Cl. 204—115 **5 Claims**



1. A method for recovering lead from galena concentrates comprising the steps of:

(a) leaching the concentrate with $FeCl_3$ solution to form a solution of $PbCl_2$ and $FeCl_2$,

(b) precipitating the $PbCl_2$ in the solution of $FeCl_2$ to form a slurry of solid $PbCl_2$ in aqueous $FeCl_2$ solution,

(c) charging the slurry to an electrolytic cell containing a cathode plate, whereby the precipitated $PbCl_2$ collects on the cathode plate,

(d) subjecting the precipitated $PbCl_2$ to electrolysis in the presence of the aqueous $FeCl_2$ solution to reduce the $PbCl_2$ to metallic lead and convert the $FeCl_2$ to $FeCl_3$, and

(e) recycling the resulting $FeCl_3$ solution from step (d) to step (a) for leaching additional concentrate.

4,181,589

METHOD FOR SEPARATING BIOLOGICAL CELLS

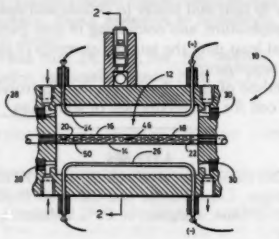
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Donald E. Brooks, Vancouver, Canada

Filed Mar. 6, 1979, Ser. No. 17,888
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—180 R **8 Claims**

1. In a method for separating biological cells, the steps comprising:

A. depositing in a separation chamber a cell suspending medium consisting of an aqueous polymer system including at least one phase which exhibits electrophoretic mobility in an electrostatic field; and

B. establishing between a pair of electrodes in an electrostatic field extending across the separation chamber for



causing droplets of said phase to migrate toward one electrode of said pair.

4,181,590

METHOD OF ION PLATING TITANIUM AND TITANIUM ALLOYS WITH NOBLE METALS AND THEIR ALLOYS

Shiro Fujishiro, Yellow Springs, and Daniel Eylon, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 825,005, Aug. 16, 1977, Pat. No. 4,137,370. This application Sep. 12, 1978, Ser. No. 941,714
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 N **3 Claims**

1. In a method for treating a substrate of titanium or a titanium alloy so as to render it resistant to oxidation, the improvement which comprises the following steps:

(a) initially implanting ions of a noble metal or noble metal alloy in the substrate by impinging the ions thereon until saturation of the substrate with the metal ions occurs; and

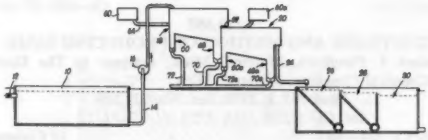
(b) thereafter continuing the impingment of the metal ions on the substrate so as to form an oxidation-resistant coating of a noble metal or noble metal alloy cohesively bonded to the ion implanted substrate, the total period of ion implantation in steps (a) and (b) ranging from about 2 to 5 minutes.

4,181,591

ELECTROSTATIC AND ELECTROLYTIC CLARIFIER APPARATUS

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Division of Ser. No. 784,559, Apr. 4, 1977, Pat. No. 4,116,789, which is a continuation-in-part of Ser. No. 713,251, Aug. 10, 1976, Pat. No. 4,045,326. This application Aug. 22, 1977, Ser. No. 826,812
Int. Cl.[2] C25B *11/02;* B03C *5/02;* B03D *3/06;* B03C *3/04*
U.S. Cl. 204—275 **9 Claims**



1. Apparatus for use in removing suspended solids from a fluid comprising:

means defining a pair of opposed, oppositely electrically charged, corrugated surfaces facing one another;

means for directing the fluid along a predetermined flow path between said surfaces,

said surfaces having the longitudinal axes of their corrugations extending transversely of said flow path to cause

undulation of the fluid as it flows across the corrugations and therefore encourage solid particles to impinge against one another and join together in larger masses,

the corrugations on each surface presenting alternating peaks and valleys, the inwardly extending peaks of the surfaces being aligned with one another so as to present alternating zones of constriction and expansion along said flow path; and

an additional pair of opposed, corrugated surfaces downstream from said first-mentioned pair, said additional pair having the longitudinal axes of their corrugations arranged transversely of the flow path therebetween, said surfaces of each pair being oppositely charged electrically with at least one surface of said first-mentioned pair being electrically insulated from the fluid and neither of the surfaces of said additional pair being electrically insulated from the fluid.

4,181,592

CONVERTING A DIAPHRAGM ELECTROLYTIC CELL TO A MEMBRANE ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 790,756, Apr. 25, 1977, Pat. No. 4,112,149, and a continuation-in-part of Ser. No. 688,842, May 21, 1976, Pat. No. 4,036,728. This application Jul. 7, 1978, Ser. No. 922,560

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] C25B *11/03, 13/08*

U.S. Cl. 204—283 **2 Claims**

1. A membrane separator for a standard diaphragm electrolytic cell comprising: a standard diaphragm cell foraminous electrode; on the surface of said standard diaphragm cell foraminous electrode, a layer of matting material of such thickness as to substantially reduce the porosity of the standard diaphragm foraminous electrode; and on the surface of said matting material, a thin and uniform hydraulically impermeable cation exchange membrane consisting essentially of a film of copolymer having the repeating structure units of the formula:

$$-CF_2-\underset{\underset{\underset{R^2}{|}}{(R)_n}}{\overset{|}{CF}}- \quad (1)$$

and

$$-CF_2-CXX^1- \quad (2)$$

wherein R represents the group

$$-CF-CF_2-O-(CFY-CF_2O)_m-,$$

in which R^1 is fluorine or perfluoroalkyl of 1 to 10 carbon atoms; Y is fluorine or trifluoromethyl; m is 1, 2 or 3; n is O or 1; X is fluorine, chlorine, or trifluoromethyl; X^1 is X or $CF_3-CF_2-_aO-$; a is O or integer from 1 to 5; and wherein R^2 is an ion exchange group selected from the group of oxy acids, salts or esters of carbon, nitrogen, silicon, phosphorous, sulfur, chlorine, arsenic, selenium or tellurium.

4,181,593

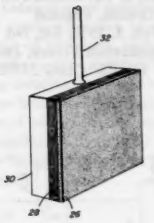
MODIFIED TITANIUM DIOXIDE PHOTOACTIVE ELECTRODES

Howard McKinzie, Framingham, and Elizabeth A. Trickett, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 22, 1978, Ser. No. 918,018

Int. Cl.[2] C25B *11/10, 11/04*

U.S. Cl. 204—290 F **2 Claims**



1. A photoactive semiconductor electrode utilizable in photoelectrochemical cells and photoassisted oxidation reactions consisting of:

a titanium metal body, a film of photoactive n-type semiconductor material on the surface of said body,

said semiconductor material consisting essentially of polycrystalline titanium dioxide and at least one oxide of a metal selected from the group consisting of the d-electron transition metals other than titanium, said metal being in a chemical oxidation state other than +4,

the metal oxide being distributed throughout the titanium dioxide with a uniform concentration gradient having a minimum at the surface of the titanium body and a maximum at the surface of said film.

4,181,594

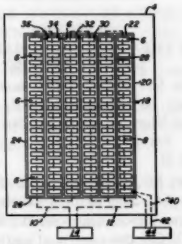
MATRIX RECOVERY ELECTROPHORESIS APPARATUS

Nabil I. Rizk, Gibsonia, and Frank Valentich, Pittsburgh, both of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa., a part interest

Filed Mar. 27, 1979, Ser. No. 24,419

Int. Cl.[2] G01N *27/28*

U.S. Cl. 204—299 R **19 Claims**



1. Electrophoresis recovery apparatus comprising

a gel slab,

a matrix member having a first surface in generally surface-to-surface contact with said gel slab and a second surface,

said matrix member having a plurality of openings therein,

said matrix member overlying said gel slab,

said matrix member openings cooperating with said gel slab to define a number of generally upwardly open wells,

means for urging said gel slab and said matrix member into intimate contact,

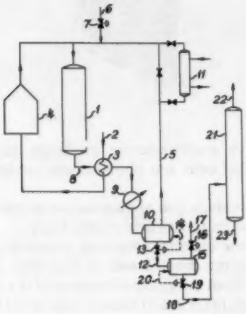
electrode means passing through said wells,
electrical means for energizing said electrode means, and
reservoir means for providing buffer solution to said gel.

4,181,595

PRODUCTION OF LUBRICANTS

Jean-Francois G. Bailly-Lacresse, St. Gratien; Albert Bonzom, Sausset les Pins, and Jean C. Courtois, Reuil Malmaison, all of France, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Feb. 1, 1978, Ser. No. 873,511
Claims priority, application France, Jan. 24, 1977, 77 01905
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—18 10 Claims



1. Process for the manufacture of lubricants having viscosity at 50° C. between 1 and 5 cSt, and pour point less than or equal to −18°, and a total aromatic content which is less than or equal to 5 percent by weight and a content of polycycloaromatic compounds which is substantially zero, showing it-self in the fact that it satisfies the FDA test, said process being characterised by the fact that it comprises hydrogenating a hydrocarbon fraction having a distillation end point higher than or equal to 350° C. and having a sulphur content between 1,000 and 3,000 ppm over a catalyst consisting of platinum deposited on a silica/alumina support containing greater than 50% by weight of silica, the support being prepared by calcining in air an intimate mixture of separately produced silica gel and alumina gel.

4,181,596

PROCESS FOR TREATING HOT SHALE OIL EFFLUENT FROM A RETORT

Harbo P. Jensen, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1978, Ser. No. 891,425
Int. Cl.[2] C10G *1/00, 31/06*
U.S. Cl. 208—11 R 9 Claims

1. In a process for producing shale oil where oil shale is retorted in a retorting zone to form a shale oil effluent, and said effluent is withdrawn from said zone at a first temperature of at least 650° F. (343° C.), the improved method for forming from said effluent a liquid product having a desirably low pour point which comprises:

(a) cooling said effluent to a second, lower, temperature within the range from 600°–800° F. (316°–427° C.);

(b) separating from said effluent a liquid shale oil phase;

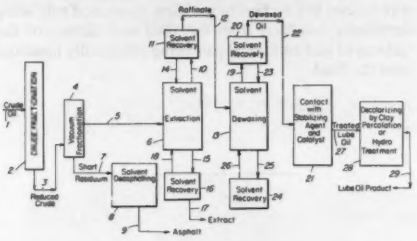
(c) lowering the pour point of said liquid phase to less than 40° F. (4.4° C.) by maintaining said liquid phase within said temperature range and below the point of significant thermal decomposition and in the absence of added hydrogen for 1 to 120 minutes, thereby forming said liquid product.

4,181,597

METHOD OF STABILIZING LUBE OILS

Tsoung-Yuan Yan, Philadelphia, Pa., and Robert F. Bridger, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 762,696, Jan. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 597,042, Jul. 18, 1975, abandoned, which is a division of Ser. No. 440,617, Feb. 28, 1974, Pat. No. 3,928,171, which is a division of Ser. No. 268,293, Jul. 3, 1972, abandoned. This application May 1, 1978, Ser. No. 901,943
Int. Cl.[2] C10G *37/06, 41/00*
U.S. Cl. 208—46 11 Claims



1. In a method for producing hydrocarbon lubricating oil, said method comprising solvent extracting a vacuum distillate fraction of a crude oil whereby recovering a hydrocarbon raffinate of reduced polyaromatics and heterocyclic compounds content, and then dewaxing said raffinate, the improvement, whereby reducing the sludge-forming tendency of said raffinate, which comprises admixing from 0.05% to about 15% by weight of a stabilizing agent selected from the group consisting of an olefin, an alcohol, an ester and an alkyl halide with said dewaxed raffinate and contacting said admixture with a heterogeneous inorganic acidic oxide at a temperature between about 25° to 350° C., a pressure of about 0 to 500 p.s.i.g., and at a LHSV of about 0.1 to about 10 to react said stabilizing agent with said raffinate.

4,181,598

MANUFACTURE OF LUBE BASE STOCK OIL

Bernard M. Gillespie, Pitman; Michael S. Sarli, Haddonfield, and Kenneth W. Smith, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 817,309, Jul. 20, 1977, Pat. No. 4,137,148. This application Dec. 20, 1977, Ser. No. 862,460
Int. Cl.[2] C10G *13/04, 37/00*
U.S. Cl. 208—58 14 Claims

1. A process for preparing a high quality lube base stock oil having a pour point of about −25° to +30° F. from waxy crude oil, which comprises:

extracting a distillate fraction that boils within the range of 450° to 1100° F. or a deasphalted short residuum fraction of said waxy crude with a solvent selective for aromatic hydrocarbons to yield a raffinate from which undesirable compounds have been removed;

mixing the raffinate with hydrogen and contacting the mixture at a temperature of 500° to 675° F. with a dewaxing catalyst comprising an aluminosilicate zeolite having a silica/alumina ratio of at least about 12 and a constraint index of about 1 to about 12, thereby converting wax contained in the raffinate to lower boiling hydrocarbons;

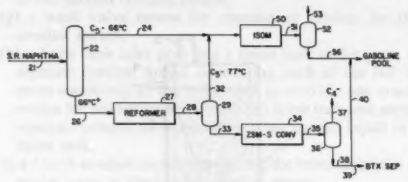
cascading the dewaxed raffinate to a hydrotreating zone wherein the dewaxed raffinate is contacted in the presence of hydrogen at a temperature of 425° to 600° F. with a hydrotreating catalyst comprising a hydrogenation component on a non-acidic support; and

topping the dewaxed, hydrotreated raffinate to remove therefrom components of a low molecular weight.

4,181,599
NAPHTHA PROCESSING INCLUDING REFORMING, ISOMERIZATION AND CRACKING OVER A ZSM-5-TYPE CATALYST

Stephen J. Miller, El Cerrito, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1978, Ser. No. 954,061
Int. Cl.[2] C07C *15/02*; B01J *29/28*; C07C *5/24*
U.S. Cl. 208—79 **6 Claims**



1. A process for upgrading a naphtha-boiling range hydrocarbon to useful products, which comprises:

(1) separating said naphtha into a light naphtha fraction boiling below methylcyclopentane and containing C_6 aliphatics and lower-boiling hydrocarbons, and a heavy naphtha fraction containing methylcyclopentane and higher-boiling hydrocarbons;

(2) reforming said heavy naphtha fraction under reforming conditions to produce a reformate stream enriched in aromatics compared with said heavy naphtha fraction;

(3) separating said reformate into a heavy reformate fraction containing benzene and higher-boiling hydrocarbons and a light reformate fraction containing C_5 and C_6 paraffinic hydrocarbons;

(4) passing said light reformate fraction together with said light naphtha fraction into contact with a hydrocarbon isomerization catalyst under isomerization conditions including a temperature from 50° to 300° C. and a pressure from 0.5 to 100 atmospheres and recovering the resultant isomerized product comprising C_5+ hydrocarbons having a higher proportion of multi-branched paraffins than the feed to the isomerizing operation;

(5) passing said heavy reformate fraction into contact with a ZSM-5-type zeolite catalyst under conditions including a temperature from 371° C. to 482° C. (700°–900° F.), a pressure from 1.7 to 55 atmospheres (10 to 800 psig), and a hydrogen to hydrocarbon mol ratio from 1 to 15 selected to effect cracking of normal and lightly branched paraffins as well as isomerization of xylenes, and recovering a hydrocarbon effluent deficient in C_6+ paraffins from the ZSM-5 contacting operation; and

(6) separating said effluent deficient in C_6+ paraffins into a C_4- stream and a C_5+ product stream enriched in benzene, toluene and xylene values.

4,181,600
CONVERSION OF CARBON MONOXIDE

Arthur W. Chester, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 25, 1978, Ser. No. 928,036
Int. Cl.[2] C10G *11/14*; B01J *8/24, 23/94*
U.S. Cl. 208—113 **6 Claims**

1. In a process for continuous catalytic cracking of hydrocarbons by contacting said hydrocarbons in a reactor with a circulating inventory of active particle form cracking catalyst under cracking conditions to produce lighter hydrocarbons and concurrently deposit on said catalyst an inactivating carbonaceous deposit, transferring catalyst so inactivated to contact in a regenerator with an oxidizing gas for combustion of said deposit to regenerate said active catalyst and product oxides of carbon as combustion products for discharge from the system, returning so regenerated active catalyst to said reactor for contact with hydrocarbons and maintaining a desired quantity of catalyst at a desired level of cracking activity as catalyst is lost from said inventory by attrition or declines in activity with time in service by adding fresh catalyst to said circulating inventory;

the improved method of adding said fresh catalyst to maintain quantity and activity of said inventory and concurrently provide activity for oxidizing carbon monoxide to carbon dioxide in said regenerator which comprises supplying said fresh catalyst as an intimate and substantially uniform blend of a minor portion of particles containing from 20 to 80 ppm of platinum, iridium, osmium, palladium, rhodium, ruthenium or rhenium and a major portion of active cracking catalyst, the proportions of said minor and major portions being such that said blend contains no more than 10 ppm of said metal, the particles of said minor portion being constituted by porous solid impregnated with said metal which particles have been calcined in air without added steam.

4,181,601
FEED HYDROTREATING FOR IMPROVED THERMAL CRACKING

Morgan C. Sze, Upper Montclair, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 807,405, Jun. 17, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,243
Int. Cl.[2] C07C *11/04, 5/10*
U.S. Cl. 208—143 **12 Claims**

1. In a process for pretreating a feed for the subsequent production of light olefins and mononuclear aromatics by thermal cracking wherein the feed is catalytically hydrotreated without excessive hydrocracking and gas production, the improvement comprising:

said hydrotreating being effected at a temperature of from 640° F. to 950° F. and a pressure of from 750 to 2500 psig, in the presence of a catalyst containing at least one group VI metal selected from the group consisting of tungsten and molybdenum and at least one group VIII metal selected from the group consisting of nickel and cobalt, said catalyst being promoted with at least 0.5 weight% of a member selected from the group consisting of fluorine, chlorine and mixtures thereof to thereby alter the feed to increase the yield of light olefins and mononuclear aromatics in the subsequent thermal cracking thereof.

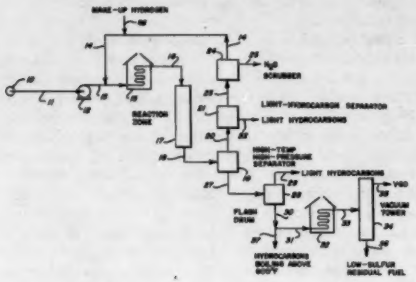
4,181,602
PROCESS FOR THE HYDROTREATING OF HEAVY HYDROCARBON STREAMS

Leonard M. Quick, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 862,847, Dec. 21, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,413
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 PP **27 Claims**

1. A process for hydrotreating a heavy hydrocarbon stream containing metals, asphaltenes, nitrogen compounds, and sulfur compounds to reduce the contents of metals, asphaltenes, nitrogen compounds, and sulfur compounds in said stream, which process comprises contacting said stream under suitable conditions and in the presence of hydrogen with a catalyst comprising (1) the metals of molybdenum, chromium, and cobalt, (2) their oxides, (3) their sulfides, or (4) mixtures thereof on a large-pore, catalytically active alumina, said molybdenum being present in an amount within the range of about 5 wt.% to about 15 wt.%, calculated as MoO_3 and based upon the total catalyst weight, said chromium being present in an amount within the range of about 5 wt.% to about 20 wt.%, calculated as Cr_2O_3 and based upon the total catalyst weight, said cobalt being present in an amount within the range of about 0.1 wt.% to about 5 wt.%, calculated as CoO and based upon the total

catalyst weight, and said catalyst possessing a pore volume within the range of about 0.4 cc/gm to about 0.8 cc/gm, a



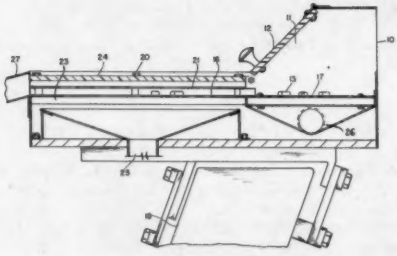
surface area within the range of about 150 m^2/gm to about 300 m^2/gm, and an average pore diameter within the range of about 100 A to about 200 A.

4,181,603

CAPSULE SORTING APPARATUS

William C. Fox, Monticello, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 30, 1978, Ser. No. 938,177
Int. Cl.[2] B07C 5/04
U.S. Cl. 209—682 **6 Claims**



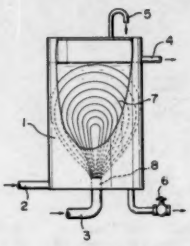
1. Apparatus for sorting capsule components consisting of assembled capsules from unassembled capsule bodies and caps comprising a conveyor plate positioned to receive the capsule components, a vibratory drive coupled to said conveyor plate for effecting progressive movement of said capsule components along said conveyor plate toward an exit chute, said conveyor plate having a plurality of circular holes with a diameter greater than the diameter of the capsule caps and less than the length of the bodies, an upper plate spaced above said conveyor at a distance less than said cap length and greater than said cap diameter, said upper plate having a plurality of circular holes in coaxial alignment, with the holes in said conveyor plate and having a diameter slightly greater than the length of an assembled capsule, said conveyor plate and said upper plate cooperating to permit passage of only said caps and said bodies through the holes in said conveyor plate.

4,181,604

PROCESS AND APPARATUS FOR WASTE WATER TREATMENT

Hisao Onishi, Hiroshima; Ryozo Numazawa, and Hitoshi Takeda, both of Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,360
Claims priority, application Japan, Apr. 13, 1977, 52-42349; Nov. 7, 1977, 52-133324
Int. Cl.[2] C02C 1/04
U.S. Cl. 210—8 **19 Claims**



1. A process for treating water polluted with organic substances by the action of microorganisms, comprising:

supporting aerobic microorganisms on the outer surface of at least one hollow fiber having a porous wall, said fiber containing pores or a size sufficiently small to prevent invasion of the pores by said microorganisms but of a size sufficient to efficiently support microorganism life by oxygen diffusion therethrough and said fiber having an outside diameter of a size sufficient to supply oxygen to said microorganisms;

supplying oxygen to said microorganisms from the interior of said hollow fiber; and

contacting said polluted water with said supported microorganisms while supplying oxygen to said microorganisms from the interior of said hollow fiber.

8. An apparatus for the biological treatment of water polluted with organic substances, comprising:

at least one hollow fiber having a porous wall and having a colony of microorganisms on the exterior surface thereof, said fiber containing pores of a size sufficiently small to to prevent invasion of the pores by said microorganisms but of a size sufficient to efficiently support microorganism life by oxygen diffusion therethrough and said fiber having an outside diameter of a size sufficient to supply oxygen to said microorganisms;

means for supplying oxygen to the interior of said hollow fiber; and

means for applying polluted water to be treated to the exterior surface of said fiber.

4,181,605

WATER SOFTENING SYSTEM

John W. Braswell, Automatic Sani-Soft Water Service, Inc., 14 N. Sprigg St., Cape Girardeau, Mo. 63701

Continuation-in-part of Ser. No. 699,215, Jun. 24, 1976, Pat. No. 4,104,165. This application Jun. 12, 1978, Ser. No. 914,512
The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.
Int. Cl.[2] B01D 23/24
U.S. Cl. 210—19 **8 Claims**

1. In a water treatment system having a treatment tank and an ion-exchange mineral bed therein, and a brine tank, regeneration control apparatus comprising:

(a) a plunger valve means including an aspirator for producing a flow of fluid;

(b) a raw liquid inlet port, and a treated liquid outlet port,

(c) a first conduit means connecting the raw liquid inlet port

to the top of the treatment tank in a first position of the plunger valve means,

(d) a second conduit means connecting the treated liquid outlet port to the lower interior of the treatment tank,

(e) a drain port and a drain valve means for opening or closing the drain port, the drain port being connected to the first conduit and the raw liquid inlet port through the aspirator in the plunger valve means in a second position of the plunger valve means when the drain valve means is opened,

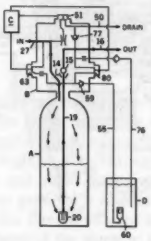
(f) a third conduit means connecting the raw liquid inlet port to the second conduit means,

(g) a wash valve means for opening or closing the third conduit means,

(h) a brine tank inlet port and a brine tank outlet port, and separate conduit means connecting each of the last said ports separately to the brine tank to provide one conduit means for delivering brine from the brine tank and another separate conduit means for delivering treated liquid to the brine tank,

(i) a fourth conduit means connecting the brine tank inlet and outlet ports to the second conduit means,

(j) a brine valve means in the fourth conduit between the



brine tank inlet and outlet ports for controlling flow therethrough,

(k) control means maintaining the drain valve means, wash valve means and brine valve means closed in the service cycle for water flow from the raw liquid inlet port, through the first and second conduit means and in one direction through the mineral bed, and through the treated liquid outlet port,

(l) the control means maintaining the drain valve means and wash valve means open, and the brine valve means closed in the brining, rinse and wash cycles for water flow from the raw liquid inlet port and through the aspirator in the plunger valve means to the drain port, and for concurrent brine flow from the brine tank inlet port, through the fourth, second and first conduit means, and for concurrent water flow from the raw liquid inlet port, through the second and first conduit means to dilute the brine and provide a diluted brine flow through the mineral bed in the said opposite direction and to the drain port, and

(m) the control means maintaining the drain valve means and the wash valve means closed and the brine valve means open in the rinse and brine tank refill cycle for liquid flow from the raw liquid inlet port, through the first, second and fourth conduits, and to the brine tank outlet port.

4,181,606

LACTAM TERPOLYMER MEMBRANES

Joseph A. Carden, Jr., Durham, and Ray McKinney, Jr., Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 6, 1978, Ser. No. 913,175

Int. Cl.[2] A61M *1/03*

U.S. Cl. 210—22 A **20 Claims**

1. In a process for dialyzing blood wherein whole venous blood is contacted in a hemodialysis apparatus with one surface of a blood dialysis membrane under dialysis conditions, physiological waste products in the blood are permeated through said membrane, and said waste products are taken up in a physiological dialyzate solution in contact with the second surface of said membrane, the improvement comprising using as said blood dialysis membrane a membrane comprising a caprolactam-polyalkylene ether-polyacyl lactam block terpolymer having from 35 to 75 percent by weight polycaprolactam blocks and from 25 to 65 percent by weight polyalkylene ether blocks and adaptable for use in hemodialysis apparatus to preferentially remove from blood medium molecular weight molecules having a molecular weight of from about 300 to about 5000.

11. A blood dialysis membrane comprising a caprolactam-polyalkylene ether-polyacyl lactam block terpolymer having from 35 to 75 percent by weight polycaprolactam blocks and from 25 to 65 percent by weight polyalkylene ether blocks, said membrane being adaptable for use in a hemodialysis apparatus to preferentially remove from blood medium molecular weight molecules having a molecular weight of from about 300 to about 5000.

4,181,607

REMOVAL OF ASBESTOS FIBERS FROM WATER

Joseph E. Schiller, and Sanaa E. Khalafalla, both of Minneapolis, Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 15, 1978, Ser. No. 942,846

Int. Cl.[2] B01D *15/00, 37/00*

U.S. Cl. 210—36 **3 Claims**

1. A method for removal of asbestos fibers from water, the concentration of the fibers in the water being about 1 to 10 parts per million, comprising filtering, the water through a layer of magnesium oxide whereby the asbestos fibers are removed from the water.

4,181,608

METHOD FOR CONDENSATION OF VAPORS FORMED IN A THERMAL SEPARATOR

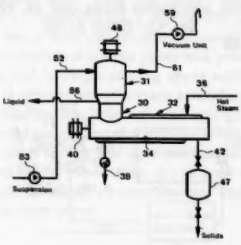
Johann Grüter, Zurich, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Mar. 22, 1978, Ser. No. 889,095

Claims priority, application Switzerland, Mar. 30, 1977, 3969/77

Int. Cl.[2] B01D *37/00*

U.S. Cl. 210—71 **9 Claims**



1. A method of removing liquid from a material containing solid and liquid substances, consisting of suspensions and/or sludges, comprising the steps of:

providing at least one mechanical separator;

infeeding the material into the mechanical separator for mechanically removing liquid therefrom in said mechanical separator;

providing at least one thermal separator;

after the removal of the liquid from the material in said mechanical separator, infeeding the thus pre-treated material into said at least one thermal separator;

drying under the action of heat the pre-treated material in said at least one thermal separator, while forming vapors in said thermal separator;

providing a flow path being sufficiently dimensioned to allow for upward passage of substantially all of the vapors between said mechanical separator and said thermal separator;

feeding substantially all of the vapors formed in the thermal separator into said at least one mechanical separator;

bringing the thus fed vapors in the mechanical separator into contact with the material therein which serves as a cooling agent; and

condensing substantially all of said vapors due to contact thereof with said material in said at least one mechanical separator.

4,181,609

BLOOD CONSTITUENTS TESTING METHOD

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405; James V. Massey, III, 80 Driftwood La., Trumbull, Conn. 06610, and Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Continuation-in-part of Ser. No. 862,543, Dec. 20, 1977, Pat. No. 4,137,755, which is a division of Ser. No. 724,563, Sep. 20, 1976, Pat. No. 4,082,085, which is a division of Ser. No. 673,058, Apr. 2, 1976, Pat. No. 4,027,660. This application Nov. 13, 1978, Ser. No. 959,462

Int. Cl.[2] B01D *17/00*

U.S. Cl. 210—72 **2 Claims**

1. In a method for obtaining a clearly defined interface between the red cell layer and the white cell layer in a sample of anticoagulated blood which comprises the steps of adding a red cell densifying compound to said sample and subsequently centrifuging said sample, the improvement comprising the step of heating the blood sample prior to centrifugation thereof to a temperature in the range of about 41° C. to about 45° C. for an incubation period in the range of about three minutes to about ten minutes prior to said centrifuging step.

4,181,610

BLOOD LEAK DETECTOR SUITABLE FOR USE WITH ARTIFICIAL KIDNEYS

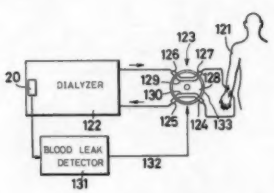
Motoaki Shintani, Minoo; Yoshikazu Wada, Hirakata; Hideo Nakamachi, Kawanishi; Masao Nishikawa, Nagaokakyo, and Akira Ouchida, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 8, 1976, Ser. No. 703,628

Claims priority, application Japan, Jul. 14, 1975, 50-86579

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—85 **11 Claims**



9. Blood leak detector which comprises: a transparent measurement cell through which dialysis solution under test flows; composite light-emitting diodes irradiating the measurement cell and having a first light-emitting diode which emits in the range of 520–600 nm and a second light-emitting diode which emits in the range of 600–750 nm; a photo detecting element to receive the light from the light emitting diodes transmitted through the measurement cell; means for driving the first light-emitting diode and the second light-emitting diode alternatively after a reference square wave signal; means for adjusting the balance between an output signal of a photo detecting element due to the first light-emitting diode and an output signal of the photo detecting element due to the second light-emitting diode in the normal state in which no blood leak exists; and means for detecting deflection from the normal state resulting from change either of the output signal of the photo detecting element due to the first light-emitting diode or of the output signal of the photodetecting element due to the second light-emitting diode.

4,181,611

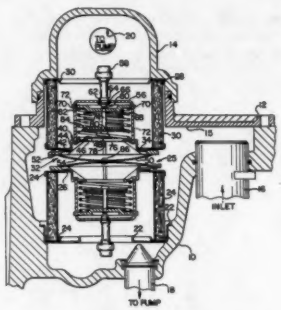
FILTER THERMAL BYPASS VALVE

Raymond D. Rubenstein, La Grange Park; Russell E. Janke, Naperville, and Charles L. Rescorla, Westmont, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1979, Ser. No. 5,626

Int. Cl.[2] B01C *27/10*

U.S. Cl. 210—149 **4 Claims**



1. A thermal and pressure differential valve for a fluid filter comprising:

a housing adapted to receive a filter element, and having an opening defining a seat;

a mounting strap strap affixed to said housing;

a thermal actuator affixed to said strap and having a plunger capable of being forced toward said seat in response to increases in temperatures;

a spring retainer slidably mounted in said mounting strap and capable of movement toward and away from said seat;

a rod member affixed to said spring retainer and having an enlarged head portion;

a valve plate slidably carried on said rod member between said retainer and said head portion;

a first compression spring trapped between said housing and said retainer for forcing the latter into contact with said plunger;

a second compression spring trapped between said valve plate and said retainer urging said valve plate against said seat but permitting said valve plate to move away from said seat when a predetermined pressure differential across said valve plate exists.

4,181,612

APPARATUS FOR SERVICING A BIRD CAGE

Lloyd G. Trail, 1883 Bay St., Port Orchard, Wash. 98366

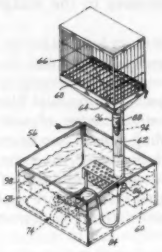
Filed Jun. 29, 1978, Ser. No. 920,382

Int. Cl.[2] B01D *23/16*

U.S. Cl. 210—169 **7 Claims**

1. In combination, a cage having a roof, sides and bottom defining a hollow, air-filled enclosure dimensioned to impound a domesticated bird; said cage being adapted to permit the bird to be viewed from outside the cage while the bird is contained therein, the bottom of the cage being part conical in vertical cross section and having surfaces thereon which slope downwardly toward a point to form a funnel-like sump under the

enclosure for the drainage of a liquid therefrom, there being a false bottom disposed in the enclosure above the sump which is apertured to retain the bird above the sump while allowing the waste material generated by the bird's occupancy of the cage to gravitate to the sump, flush means including a nozzle adjacent the false bottom for discharging a liquid onto the surfaces of the sump to collect and entrain portions of the waste material therein for removal from the sump, a filter unit comprising a bed of particle matter which is adapted so that the waste entraining liquid can be passed therethrough while elements of the waste material are filtered therefrom, and which is also adapted to support bacterial life thereon that subjects the waste



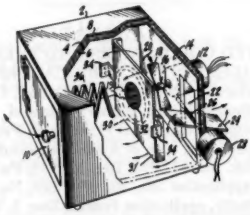
elements to biological degradation, conduit means connected with the bottom of the sump to convey the waste-entraining liquid to the bed of particle matter, pump means for inducing the waste-entraining liquid to flow through the bed of particle matter between inlet and outlet points on relatively opposite sides thereof and thus generate a filtered effluent, and pump means for returning the filtered effluent to the nozzle for discharge onto the surfaces of the sump to collect and entrain a new portion of the waste material therein for removal from the sump, whereby the sump is continually flushed by the liquid and the liquid is continually renewed as a flush medium by the filter unit.

4,181,613

VENTING METHOD FOR A CHROMATOGRAPH OVEN

Paul B. Welsh, Wilmington, and Stephen Van Lukas, Newark, both of Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 8, 1977, Ser. No. 785,992
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—179 **4 Claims**



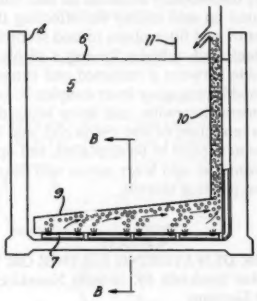
1. A chromatograph oven comprising,
a housing having rectangular front, rear and four side walls defining a cavity within them,
an inner rear wall in said cavity spaced from said rear wall of said housing,
a door mounted in said front wall of said housing,
a fan mounted for rotation within said cavity about an axis extending through central sections of said front and rear walls of said housing,
means defining an exhaust port in said inner rear wall of said cavity at a corner of said rear wall,
a first duct extending through said housing from the means defining said exhaust port so as to communicate between said cavity and ambient air,
means defining an intake port about the axis of said fan in said rear wall of said cavity,
a second duct extending through said housing from said means defining said intake port so as to communicate between said cavity and ambient air,
means including a first flap for opening and closing said first duct, and
means including a second flap for opening and closing said second duct.

4,181,614

SLUDGE REMOVAL APPARATUS

Johannes Steenhorst, Brussels, Belgium, assignor to The British Petroleum Company Limited, Sunbury-on-Thames, England

Continuation of Ser. No. 803,809, Jun. 6, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,025
Claims priority, application United Kingdom, Jun. 17, 1976, 25110/76
Int. Cl.[2] B01D *43/00*; B03D *1/14, 1/26*
U.S. Cl. 210—221 P **1 Claim**



1. Apparatus for the removal of sludge from an installation containing a liquid and having sludge at the bottom, which apparatus comprises (a) at least one sparge pipe having gas distribution holes connected to a means for supplying gas under pressure, (b) at least one inverted channel means corresponding to the number of sparge pipes and positioned above each sparge pipe and having a sloping upper surface leading to a riser pipe, the inverted channel means extending wholly over all of the gas distribution holes of said sparge pipe so that substantially all the gas passing through the sludge rises up into the inverted channel means and does not pass up through the rest of the liquid in the installation, (c) at least one riser pipe connected to said inverted channel means, and (d) a gutter means fed by the riser pipes.

4,181,615

FILTER APPARATUS

Hans Wilms, von Luninck Str. 16, 5750 Menden, Fed. Rep. of Germany

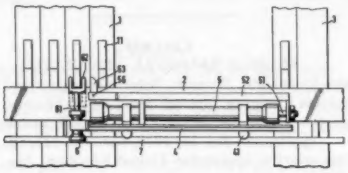
Filed Sep. 13, 1978, Ser. No. 942,095
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741659
Int. Cl.[2] B01D *25/12, 25/34*
U.S. Cl. 210—230 **8 Claims**

1. A filter apparatus, comprising:
an elongated beam;
a filter press, having a plurality of consecutively-arranged, movable filter plates displaceably mounted on said beam,

for reciprocable movement between a first and second end position, in which said plates abut one another;

a displaceable hydraulic closure disposed adjacent to said beam and opposing one end of said plurality of filter plates, said closure being reciprocably movable between a first operative position, in which said closure engages and moves said filter plates into abutting relationship in said first end position thereof, and a second operative position in which said closure serves as an abutment stop against which said plurality of filter plates may rest when displaced to said second end position thereof; and

a plate conveying device for successively moving said filter plates from said first to said second end position thereof,



said plate conveying device including at least one rail disposed along and adjacent to said filter plates, at least one trolley displaceably mounted on said rail, a feed cylinder mounted on said trolley for effecting the successive movement of said filter plates to said second end position thereof, said feed cylinder having a displaceable piston rod movable between a retracted and extended position; and a pivotable, engaging lever coupled to said piston rod for movement therewith, said lever being disposed such that, upon retraction of said piston rod, said lever engages behind the next plate to be displaced, and upon extension of said piston rod, said lever moves said next plate to said second end position thereof.

4,181,616

DEVICE FOR DEWATERING SLUDGE OR THE LIKE

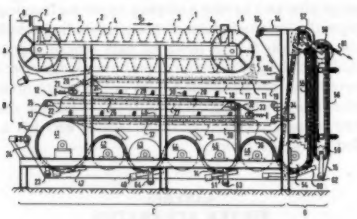
Albert Bahr, Am Stockfeld 69, D-6680 Neunkirchen-Kohlhof, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 632,689, Nov. 17, 1975, abandoned. This application Jul. 28, 1977, Ser. No. 820,015

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635196

Int. Cl.[2] **B01D** *33/00*

U.S. Cl. 210—297 **27 Claims**



1. A device for dewatering sludge comprising:

means for supplying sludge to be dewatered;

A first gravity pressure dewatering stage having a plurality of endlessly rotating perforated filter pockets for receiving sludge from said means for supplying and for straining water therethrough;

a second dewatering stage located below and coupled to the output of said first dewatering stage, said second stage including a plurality of sequentially arranged horizontal dewatering zones and a pair of perforated horizontal filter belts each associated with a respective horizontal dewatering zone, the output of one horizontal zone feeding the input of another for further straining water from sludge exiting from said first stage, said horizontal dewatering zones being provided one above another with a first such horizontal dewatering zone receiving output sludge from said first stage, each of said horizontal filter belts sliding across a respective horizontal dewatering zone on a flat surface permeable to fluid and cooperating with the other filter belt to form a wedge shaped compartment in each horizontal zone which tapers in the direction of sludge movement through the associated horizontal dewatering zone, said wedge shaped compartment applying greater than gravity pressure to the sludge as it passes therethrough;

a third dewatering stage located below said first and second dewatering stages and coupled to receive the output sludge of said second dewatering stage, said third stage receiving said pair of horizontal filter belts from the last horizontal dewatering zone of said second dewatering stage and including at least two drums against which said pair of filter belts is pressed, the pressure applied to sludge by the pressing contact of said pair of filter belts with said drums being higher than pressure applied to sludge by said pair of filter belts defining said wedge shaped compartment; and,

a fourth dewatering stage for receiving said pair of filter belts from said third stage and applying pressure to sludge greater than that applied by said third dewatering stage and for discharging dewatered sludge, said fourth stage comprising two endless rotating platen belts pressurized towards one another, said pair of filter belts passing through the nip defined by said platen belts.

4,181,617

AQUEOUS DRILLING FLUID AND LUBRICANT COMPOSITION

Stephen H. Elrod, and Weldon B. Nance, both of Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

Filed Feb. 13, 1978, Ser. No. 877,484

Int. Cl.[2] **C09K** *7/02;* **C10M** *3/32*

U.S. Cl. 252—8.5 C **10 Claims**

1. A lubricant additive for aqeuous drilling fluids consisting essentially of the reaction product of from between about 99.5 percent by weight and about 98 percent by weight of a fatty vegetable oil and from between about ½ percent by weight and about 2 percent by weight of 4, 4'-thiodiphenol, the reaction occurring in the presence of heat from between about 110° F. and about 180° F. or upon the application of shear at normal room temperature.

4,181,618

GRAFTED COPOLYMERS AND THEIR USE AS ADDITIVES FOR LUBRICATING OILS

Jean-Pierre Durand, Chatou; Patrick Gateau, Trappes; Francois Dawans, Bougival, and Bernard Chauvel, Ermont, all of France, assignors to Institut Francais du Petrole and Rhone-Poulenc Industries, both of Rueil-Malmaison, France

Division of Ser. No. 637,393, Dec. 3, 1975, Pat. No. 4,085,055. This application Jan. 30, 1978, Ser. No. 873,443

Claims priority, application France, Dec. 3, 1974, 74 39511

Int. Cl.[2] **C10M** *1/32*

U.S. Cl. 252—51.5 A **12 Claims**

1. A graft copolymer of:

(a) a substrate consisting essentially of a hydrogenated polymer or copolymer selected from the group consisting of (i) homopolymers of conjugated dienes having from 4 to 6 carbon atoms, (ii) copolymers of at least two conjugated dienes having from 4 to 6 carbon atoms, and (iii) copolymers of conjugated dienes having from 4 to 6 carbon atoms with styrene, said hydrogenated polymer or copolymer having a residual olefinic unsaturation after hy-

drogenation of from 0 to 5% of the units contained therein, a weight average molecular weight from 30,000 to 100,000 and a distribution of the molecular weights defined by a ratio M_w/M_n lower than 2; and

(b) graft polymerized chains of (i) at least one vinyl compound selected from the group consisting of N-vinylpyrrolidone, N-vinylimidazole and vinylpyridine, and (ii) at least one unsaturated ester selected from the group consisting of methyl, butyl, dodecyl, stearyl and 2-hydroxyethyl acrylates and methacrylates.

8. A lubricating composition comprising a major proportion of lubricating oil and a proportion of at least one graft copolymer according to claim 1, which is sufficient to improve both the viscosity index and the dispersing power of said lubricating oil.

11. A graft copolymer of:

(a) a substrate consisting essentially of a hydrogenated polymer or copolymer selected from the group consisting of (i) homopolymers of conjugated dienes having from 4 to 6 carbon atoms, (ii) copolymers of at least two conjugated dienes having from 4 to 6 carbon atoms, and (iii) copolymers of conjugated dienes having from 4 to 6 carbon atoms with styrene, said hydrogenated polymer or copolymer having a residual olefinic unsaturation after hydrogenation of from 0 to 5% of the units contained therein, a weight average molecular weight from 30,000 to 100,000 and a distribution of the molecular weights defined by a ratio M_w/M_n lower than 2; and

(b) graft polymerized chains of at least one vinyl compound selected from the group consisting of diethylaminoethyl acrylate, diethylaminoethyl methacrylates, and N-methacryloyloxyethylmorpholine.

4,181,619
ANTIWEAR COMPOSITION

Robert H. Schmitt, Woodbury, and Ronald J. Poole, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,860
Int. Cl.[2] C10M *1/46, 1/40, 3/40, 3/54*
U.S. Cl. 252—32.5 **10 Claims**

1. An antiwear additive having multimetal compatibility which concommitantly provides corrosion control, rust protection and improved cleanliness and is readily soluble in oils of lubricating viscosity comprising (A) the reaction product of benzotriazole and tricresyl phosphate and (B) the combination consisting of calcium dinonyl naphthalene sulfonate and calcium alkyl phenate.

6. An oleaginous composition comprising a major amount of an oil of lubricating viscosity and a minor effective antiwear amount of a lubricant additive package as described in claim 1.

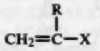
4,181,620
LIQUID DEVELOPER FOR USE IN ELECTROPHOTOGRAPHY

Kazuo Tsubuko, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 646,341, Jan. 2, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 832,100
Claims priority, application Japan, Jan. 7, 1975, 50/4556
Int. Cl.[2] G03G *9/12*
U.S. Cl. 430—114 **23 Claims**

1. A liquid developer for use in electrophotography comprising coloring agent particles and an A resin dispersed in a carrier liquid having a high electric resistivity and a low dielectric constant, said coloring agent particles having an average particle size in the range of from 0.01 to 20 microns and having an electric resistivity of about 10^8 to 10^{14} Ωcm, said coloring agent particles consisting essentially of fine pigment particles substantially completely coated with B resin which is substantially insoluble in said carrier liquid, said coloring agent particles having been prepared by kneading an aqueous paste of pigment with an organic solvent solution of said B resin to displace the water from the pigment and to replace it by said solution of said B resin, followed by removing water and said solvent and then pulverizing the resulting dry solids, said A resin being a non-aqueous thermoplastic resin prepared by effecting graft polymerization between

(a) a copolymer of (i) monomer having the formula

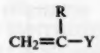


wherein R is H or CH_3, and X is $COOC_nH_{2n+1}$ or OC_nH_{2n+1} and $6 \leqq n \leqq 20$, and (ii) glycidyl acrylate or glycidyl methacrylate, or (iii) unsaturated carboxylic acid or unsaturated carboxylic acid anhydride,

and

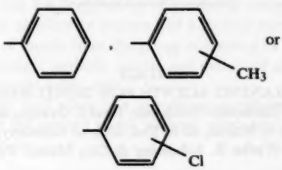
(b) a first grafting monomer which is an unsaturated carboxylic acid or unsaturated carboxylic acid anhydride when said copolymer has been prepared using glycidyl acrylate or glycidyl methacrylate, or which is glycidyl acrylate or glycidyl methacrylate when said copolymer has been prepared using said unsaturated carboxylic acid or unsaturated carboxylic acid anhydride,

and then further grafting a second grafting monomer selected from the group consisting of

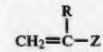


wherein R has the same meaning as defined above, and Y is

$-COOC_{n'}H_{2n'+1}$ and $1 \leqq n' \leqq 4$
$-OCOC_mH_{2m+1}$ and $1 \leqq m \leqq 6$

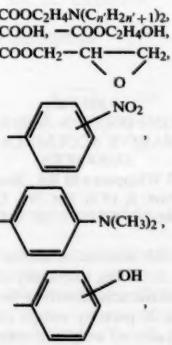


and

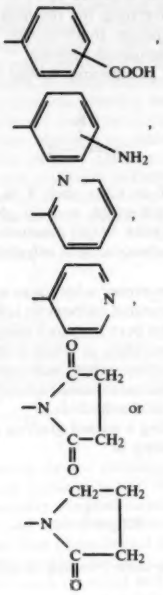


wherein R has the same meaning as defined above, and Z is

$-COOC_2H_4N(C_{n'}H_{2n'+1})_2$,
$-COOH$, $-COOC_2H_4OH$,
$-COOCH_2-CH\!-\!CH_2$



-continued



4,181,621

CLEANING AGENTS FOR DENTURES

Helmut Raaf, Karlsruhe-Waldstadt; Raul L'Orange, and Helmut Harth, both of Mainz, all of Fed. Rep. of Germany, assignors to Blendax-Werke R. Schneider & Co., Mainz, Fed. Rep. of Germany

Filed Jul. 8, 1975, Ser. No. 594,106
Int. Cl.[2] C11D 7/54
U.S. Cl. 252—102 9 Claims

1. A denture cleaning composition suitable for cleaning dentures consisting essentially of at least 30 percent by weight of the total composition of urea and at least one member selected from the group consisting of a surface active agent, a flavoring agent, a filler, a complexing agent, a binding agent and an antimicrobial agent.

4,181,622

CLEANING COMPOSITION AND METHOD FOR REMOVING MARINE ACCUMULATIONS FROM SURFACES

David C. Gavin, 127 Whippoorwill Rd., Brandon, Miss. 39042

Filed Nov. 1, 1976, Ser. No. 737,585
Int. Cl.[2] C11D 1/04, 7/50
U.S. Cl. 252—143 12 Claims

1. A composition for removal of marine accumulations and stains from surfaces consisting essentially of from about 5 to 20 parts by weight of oxalic acid dissolved in a solution comprising from about 10 to 20 parts by weight of a C_1 to C_3 alkanol and about 80 to 90 parts by weight of water.

4,181,623

CLEANING COMPOSITIONS

Alan Dillarstone, Bramhall, and Alan Straw, Macclesfield, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,982
Claims priority, application United Kingdom, Mar. 15, 1977, 10881/77
Int. Cl.[2] C11D 7/50, 7/08
U.S. Cl. 252—143 11 Claims

1. A composition suitable for cleaning articles of glass and glazed ceramic consisting essentially of 0.05% to 0.5% by weight of hydrofluoric acid or an acid salt thereof; a water-soluble acid selected from the group consisting of 0.02% to 4% by weight of an organic acid selected from the group consisting of acetic acid, hydroxyacetic acid, propionic acid and lactic acid and 0.05% to 0.8% by weight of a non-oxidizing mineral acid other than hydrofluoric acid having an equivalent weight greater than 20; 0.01% to 0.5% by weight of a water-soluble, organic, anionic or nonionic detergent; 0% to 10% by weight of a solvent selected from the group consisting of C_1–C_4 alkyl ethers of ethylene glycol, C_1–C_4 alcohols and C_2–C_4 ketones; and water.

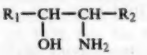
4,181,624

AMINOALKANOLS

Karl H. Koch, Haan, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 683,319, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 521,245, Nov. 6, 1974, abandoned. This application Mar. 24, 1978, Ser. No. 889,989
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1973, 2356322
Int. Cl.[2] C07C 91/02
U.S. Cl. 252—182 8 Claims

1. Mixtures of at least two aminoalkanols of the formula:



wherein R_1 and R_2 represent C_{1-21} alkyl; and wherein the sum of the carbon atoms in R_1 and R_2 is between 6 and 22 and the vicinal substituents are uniformly distributed along the R_1—CH—CH—R_2 chain.

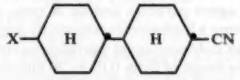
4,181,625

LIQUID CRYSTALLINE CYCLOHEXYLCYCLOHEXANES

Rudolf Eidenschink; Joachim Krause, and Ludwig Pohl, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,580
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702598
Int. Cl.[2] C07C 121/46; C09K 3/34; G02F 1/13
U.S. Cl. 252—299 14 Claims

1. A trans-trans-cyclohexylcyclohexane of the formula



wherein X is —R, —OR or —O—CO—R and R is straight-chain alkyl of 1–12 C-atoms or alkyl of 1–12 carbon atoms containing only one chain branch, that branching being on the connecting carbon atom or one of the next two carbon atoms.

13. A liquid crystalline dielectric composition comprising at

least 2 liquid crystalline components, wherein at least one component is a compound of claim 1.

4,181,626

METHOD OF PREPARING TUNGSTEN HEXACARBONYL CONTAINING POLYMERS AND POLYMERS PREPARED THEREBY

Ivan R. Leatherman, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1977, Ser. No. 864,355
Int. Cl.[2] F21V *9/04, 9/12*
U.S. Cl. 252—300 24 Claims

1. A light absorbing liquid composition provided by heating a liquid composition consisting essentially of an olefinically unsaturated carboxylic acid and a light absorbing quantity of tungsten hexacarbonyl.

3. A polymerizate of an olefinically unsaturated carboxylic acid and a bis(allyl carbonate) containing a light absorbing component provided by the reaction of the olefinically unsaturated carboxylic acid in the presence of about 0.1 to about 3 weight percent tungsten hexacarbonyl basis total organics.

4,181,627

HIGH FLUORESCENT EFFICIENCY ZINC OXIDE CRYSTALS AND METHOD OF MAKING SAME

Richard L. Weiher, Hudson Twp., ST. Croix County, Wis.; Gerhard W. Voll, Moundsview, and Kjell I. Hagemark, Norway, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 291,023, Sep. 21, 1972, abandoned. This application Feb. 19, 1975, Ser. No. 551,057
Int. Cl.[2] C09K *11/26, 11/10*
U.S. Cl. 252—301.6 R 4 Claims

1. A method of treating a high purity single crystal of zinc oxide characterized by a minimum dimension of at least 0.1 mm and having a concentration of acceptors less than about 10 parts per million, which method comprises

heating the crystal in the presence of a donor-providing material selected from the group consisting of Zn, ZnS, CdS, S, In_2O_3, $In(NO_3)_3$, Ga and H_2 for a time and at a temperature sufficient to allow homogeneous and uniform diffusion throughout the crystal of a concentration of donors sufficient to compensate said acceptor concentration but not exceeding 20 parts per million, thereafter rapidly cooling said crystal to keep substantially all of the uniformly diffused donors homogeneously distributed in the interior of the crystal, followed by removing a thin outer layer of said rapidly cooled crystal to give the crystal a high external fluorescent efficiency in the near ultraviolet of at least 0.001 when measured at 77° K. and to enable said crystal to exhibit uniform fluorescence in the interior of the crystal.

4,181,628

CATALYST FOR OXIDATION REACTIONS AND PROCESS FOR ITS PRODUCTION

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Filed May 23, 1977, Ser. No. 799,331
Claims priority, application Switzerland, May 21, 1976, 6466/76
Int. Cl.[2] B01J *27/14;* B01D *15/06*
U.S. Cl. 252—435 45 Claims

1. Activated catalyst for oxidation reactions on the basis of a mixed oxide of vanadium and phosphorus, characterized in that the vanadium has an average valence of less than +3.9, the atomic ratio of phosphorus to vanadium is between 1.05 to 1 and 1.10 to 1, the catalyst is activated at a temperature of 300° to 450° C. by passing over the mixed oxide the gaseous hydrocarbon component, which has 2 to 6 carbon atoms, in the absence of molecular oxygen the catalyst can be reactivated, and the catalyst having been calcined before activation.

4,181,629

CATALYST FOR THE OXIDATION OF METHANOL TO FORMALDEHYDE AND A METHOD OF PREPARING THE CATALYST

Luciano Cairati, Cassano D'Adda, and Lucio di Fiore, Milan, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Jun. 19, 1978, Ser. No. 916,691
Int. Cl.[2] B01J *21/04, 21/08, 23/88*
U.S. Cl. 252—458 11 Claims

1. A catalyst active and selective in the oxidation of methanol to formaldehyde and usable in the fluidized form in said oxidation, which consists essentially of iron and molybdenum oxides on a granular support, said support being a silica or an alumina having a specific surface area not exceeding 1 m^2/g and an overall pore volume not exceeding 0.2 ml/g and said oxides being present in the catalyst in an amount not exceeding 2 parts by weight for each 100 parts by weight of the support and in an atomic ratio between molybdenum and iron of from 1.5:1 to about 2.5:1.

4,181,630

CATALYST FOR SYNTHESIS OF METHANOL

Elizabeth G. Baglin; Gary B. Atkinson, both of Reno, and Larry J. Nicks, Fernley, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 30, 1978, Ser. No. 964,860
Int. Cl.[2] B01J *23/10, 23/12, 23/72*
U.S. Cl. 252—476 8 Claims

1. A method for preparation of a catalyst comprising:

a. forming an alloy of copper and a second metal or combination of metals from the group consisting of yttrium, rare earth metals, actinide metals and metals of group IVB of the periodic table; and

b. reacting said alloy in a gaseous atmosphere in order to oxidize the second metal without substantial oxidation of the copper.

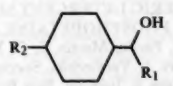
4,181,631

ALPHA-HYDROXYALKYL-4-TERTIARY-ALKYLCYCLOHEXANE PERFUME COMPOSITIONS

Gary W. Shaffer, Trumbull, Conn., and Kenneth L. Purzycki, Lake Parsippany, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 541,027, Feb. 12, 1975, abandoned. This application Feb. 1, 1977, Ser. No. 764,668
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 26 Claims

1. A compound of the formula



wherein:

R_1 is selected from the group consisting of from one to three carbon atoms;

R_2 is selected from the group of tertiary alkyl radicals of four to eight carbon atoms;

The carbon of R_2 bonded to the cyclohexyl ring is the tertiary carbon;

The number of carbon atoms in $R_1 + R_2$ does not exceed ten.

4,181,632

ELASTIC DETERGENT BAR

Frank Schebece, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,999
Int. Cl.[2] C11D *1/50, 17/00, 1/12, 1/94*
U.S. Cl. 252—542 **10 Claims**

1. A hand squeezable, elastic, solid molded detergent product comprising about 10 to 80% of a synthetic organic detergent selected from the group consisting of anionic sulfated and sulfonated synthetic organic detergents and amphoteric synthetic organic detergents, said anionic sulfated and sulfonated synthetic organic detergents being water soluble and selected from the group consisting of alkali metal, triethanolamine and ammonium linear higher alkylbenzene sulfonates, paraffin sulfonates, olefin sulfonates, higher fatty alcohol sulfates, monoglyceride sulfates and higher fatty alcohol polyethylene glycol sulfates and mixtures thereof and the amphoteric detergent being water soluble and selected from the group consisting of betaaminopropionates, betaiminodipropionates and imidazolium salts and mixtures thereof, about 5 to 30% of gelatin, about 5 to 60% of water and about 1 to 5% of a compound selected from the group consisting of cross-linking agents and denaturing agents for the gelatin and mixtures thereof when the synthetic organic detergent is an anionic detergent, which product is sufficiently squeezable and elastic so that a 2 cm. thickness thereof can be pressed between a thumb and forefinger to a 1 cm. thickness and upon release of such pressure will return within five seconds to within 1 mm. of the 2 cm. thickness.

4,181,633

LIQUID SCOURING CREAM CONTAINING CALCIUM METASILICATE

Daniel Colodney, Somerville, and Martin Cordon, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,446
The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.
Int. Cl.[2] C09G *1/02;* **C11D** *3/08*
U.S. Cl. 252—525 **13 Claims**

1. A stable, pourable, liquid scouring composition providing effective cleaning with reduced abrasion on porous and nonporous hard surfaces comprising about 45–55% by weight of an abrasive system containing at least 20% by weight of calcium metasilicate in the form of particles having a mean diameter in the range of about 5.5 to 16 microns and having a Mohs hardness value of about 5, suspended in an aqueous vehicle containing about 2–15% by weight of at least one surface active agent selected from the group consisting of anionic and nonionic detergents.

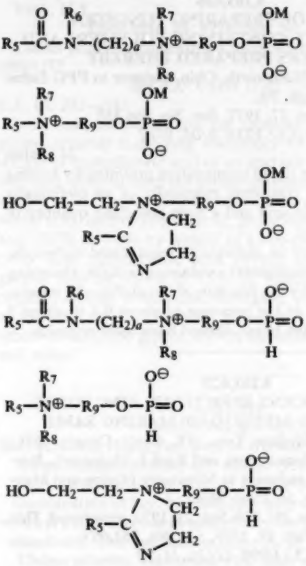
4,181,634

MILD CLEANSING COMPOSITIONS COMPRISING AN ALKYLENEOXYLATED BISQUATERNARY AMMONIUM COMPOUND AND AN ANIONIC OR AMPHOTERIC DETERGENT SUCH AS A PHOSPHOBETAINE

Robert R. Kennedy, Parlin; Martin K. O. Lindemann, Bridgewater, and Robert J. Verdicchio, Succasunna, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 807,768, Jun. 17, 1978, Pat. No. 4,110,263. This application May 5, 1978, Ser. No. 902,121
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] C11D *1/94, 1/90, 1/88, 1/62*
U.S. Cl. 252—545 **10 Claims**

1. A cosmetic cleansing composition comprising a detergent component in admixture with an alkylene-oxylated bisquaternary ammonium compound component wherein said detergent component comprises at least one amphoteric detergent selected from the group consisting of



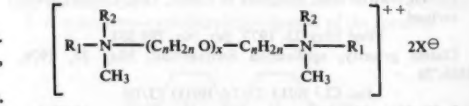
wherein R_5 is straight or branched chain alkyl, alkenyl, arylalkyl or cycloalkyl containing from 6 to 26 carbon atoms; R_6 is hydrogen, straight or branched chain alkyl, alkenyl, cycloalkyl or hydroxyalkyl containing from 1 to 6 carbon atoms; R_7 and R_8 may be the same or different and are straight or branched chain alkyl or hydroxyalkyl containing from 1 to 6 carbon atoms or a polyoxyalkylene ether radical of the formula

$$-(R'-O)_b-R''-.$$

wherein

R′ and R″ are alkylene and alkyl, respectively, containing from 1 to 4 carbon atoms and b is an integer from 2 to 10;

R_9 is straight or branched chain alkylene or hydroxyalkylene containing from 1 to 6 carbon atoms; M is straight or branched chain alkyl or hydroxyalkyl containing from 1 to 6 carbon atoms, polyhydroxyalkyl containing from 1 to 6 carbon atoms, alkali metal, alkaline earth metal or a substituted ammonium compound selected from mono-, or di- or triethanolamine; and a is an integer from 1 to 5; said alkyleneoxylated bisquaternary ammonium compound component contains one or more compounds represented by the formula



wherein R_1 is an aliphatic radical of from about 10 to about 26 carbon atoms, R_2 is methyl, ethyl, propyl or R_1, X is an anion, n is 2 or 3, and x is an integer of from 1 to about 30; and said detergent component is present in an amount of from about 4 percent to 40 percent by weight of the composition and the weight ratio of said bisquaternary ammonium compound to detergent is from about 0.01:1 to about 0.3:1.

4,181,635

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Hideo Takamatsu; Shobu Minatono; Katsuyoshi Terao, and Junnosuke Yamauchi, all of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 17, 1978, Ser. No. 878,889
Claims priority, application Japan, Feb. 21, 1977, 52-18441
Int. Cl.[2] C08L *7/00, 9/02, 9/06;* C09J *3/12*
U.S. Cl. 260—5 11 Claims

1. In a pressure-sensitive adhesive composition comprising a low molecular weight polyisoprene (A), an elastomer (B) selected from the group consisting of polybutadiene, cis-1,4-polyisoprene, natural rubber, styrene-butadiene random or block copolymer, styrene-isoprene random or block copolymer, acrlyonitrile-butadiene copolymer, acrylonitrile-isoprene copolymer, ethylene-propylene copolymer, ethylene-vinyl acetate copolymer, chloroprene rubber, polyisobutylene and butyl rubber, and a tackifying resin (C), wherein the improvement comprises:

using as said low molecular weight polyisoprene (A) a polyisoprene having a cis-1,4 content of at least 75%, a viscosity average molecular weight of between 8,000 and 77,000 and a $\overline{M}_w/\overline{M}_n$ value of from 1.0 to 2.7, wherein Mw is the weight average molecular weight and $\overline{M}n$ is the number average molecular weight; and wherein the weight ratio of said polyisoprene (A) to said elastomer (B) is 5-85:95-15, and wherein said tackifying resin (C) comprises up to 250 weight parts for each 100 weight of said elastomer.

4,181,636

PROCESS FOR PRODUCING IMMUNOLOGICAL DIAGNOSTIC REAGENTS

Ernst A. Fischer, Münchenstein, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 11, 1978, Ser. No. 941,344
Claims priority, application United Kingdom, Sep. 19, 1977, 38893/77
Int. Cl.[2] C08L *89/00*
U.S. Cl. 260—8 21 Claims

1. A process for producing a water-insoluble immunological diagnostic reagent comprising:

(a) providing an immunologically inert carboxylated latex polymer which is substantially free from any contaminating amino compounds;

(b) mixing said immunologically inert carboxylated latex polymer with a water-soluble activating agent; and

(c) adding an immunologically active material thereto to link the immunologically active material with the immunological inert carboxylated latex polymer, and thereby form the diagnostic reagent.

4,181,637

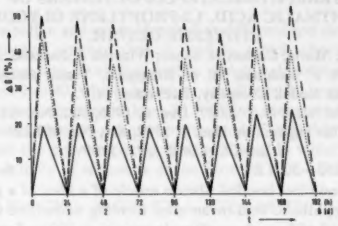
SHEET-LIKE STRUCTURE OF POLYURETHANE, WHICH IS CAPABLE OF ABSORBING WATER VAPOR AND TRANSMITTING WATER VAPOR

Walter Busch; Arno Holst, both of Wiesbaden, and Wilhelm Fischer, Pirmasens, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,446
Claims priority, application Luxembourg, Dec. 24, 1976, 76474
Int. Cl.[2] C08L *1/28, 3/08*
U.S. Cl. 260—16 3 Claims

1. In a sheet-like structure of polyurethane, which is capable of absorbing water vapor and transmitting water vapor, with a uniformly incorporated additive,

the improvement comprising that said additive is composed of solid particles of at least one modified starch ether or cellulose ether, which has been modified by cross-linking, effected by means of heat energy, radiation or an additional chemical compound, which is insoluble in water to



the extent of at least 50% by weight, and which is swellable in aqueous liquids.

4,181,638

HIGH SOLIDS POLYESTER RESIN-BASED COATING COMPOSITION AND METHOD OF MAKING SAME

Edward A. Lasher, 1141 Shadow Hill Way, Beverly Hills, Calif. 90210

Filed May 8, 1978, Ser. No. 903,571
Int. Cl.[2] C09D *3/52, 3/64, 3/66*
U.S. Cl. 260—22 R 42 Claims

1. An hydroxyl-bearing, polyester resin suitable for combination with a cross-linking agent to form a heat-curable, film-forming composition comprising at least about 90% by weight solids, said polyester resin being the condensation reaction product obtained by the heating of

(a) an aliphatic diol having about 4 to about 9 carbon atoms with

(b) a cyclic dicarboxylic acid or anhydride thereof and

(c) a mono carboxylic fatty acid having between about 8 and about 20 carbon atoms

in a reaction mixture in which said (a) is present in an amount sufficient to provide hydroxyl groups in excess of the carboxyl groups from said acids and which has a system functionality between about 1.6 and about 1.8, the molar ratio of said (b) to said (c) being between about 4:1 and about 1.5:1.

4,181,639

POLYMER SOLUTIONS

Bruno Bömer, Leverkusen; Hildegard Schnöring, Wuppertal, and Rolf Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,895
Claims priority, application Japan, Jul. 30, 1977, 2734577
Int. Cl.[2] C08L *33/26*
U.S. Cl. 260—29.6 WB 2 Claims

1. Aqueous polymer solutions containing water and 5 to 30% by weight of a polymeric mixture of

(A) a copolymer consisting of 65 to 90 mole percent of statistically distributed residues of acrylamide and 10 to 35 mole percent of residues of maleic acid or maleic acid anhydride, and which has an intrinsic viscosity (η) of 0.05 to 1 (dl/g), and

(B) a copolymer consisting of 65–90 mole percent of statistically distributed polymerized residues of acrylamide and acrylic acid and 10–35 mole percent of residues of maleic acid, at least some of the maleic acid residues being present in salt from, and said copolymer having an intrinsic viscosity (η) of from 0.05 to 1.5 (dl/g),

and the ratio by weight of copolymer (A) to copolymer (B) is from 1:2 to 20:1.

4,181,640

FIBERS, FILTER RODS AND OTHER NONWOVEN ARTICLES MADE FROM POLY(1,2-PROPYLENE TEREPHTHALATE) COPOLYESTERS OF TEREPHTHALIC ACID, 1,2-PROPYLENE GLYCOL AND ETHYLENE GLYCOL

Gerald P. Morie; Cephas H. Sloan; Winston J. Jackson, Jr., and Herbert F. Kuhfuss, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 748,037, Dec. 6, 1976, Pat. No. 4,145,518. This application Dec. 8, 1978, Ser. No. 967,654

Int. Cl.[2] C08K 5/15, 5/09

U.S. Cl. 260—30.4 R **6 Claims**

1. A plasticizer bonded fibrous article of a fiber of a polyester of terephthalic acid or an ester forming derivative thereof and a glycol of from about 60 mole percent to 100 mole percent 1,2-propylene glycol and from 0 to about 40 mole percent ethylene glycol; said polyester having an inherent viscosity of at least about 0.35 in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.5 gram of polyester in 100 ml. of said solvent, and a Tg of at least 80° C.

3. The plasticizer bonded fibrous article of claim 1 wherein the plasticizer is selected from the group consisting of triethylene glycol diacetate, glycerol triacetate, dimethyl phthalate, 1,3-butanediol diacetate, and γ-butyrolactone or mixtures thereof.

4,181,641

POLYETHERAMIDE-ACID-IMIDE SOLUTION AND PROCESS FOR PREPARATION THEREOF

Edith M. Boldebuck, Schenectady, and Eugene G. Banucci, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 761,946, Jan. 24, 1977, Pat. No. 4,115,341. This application Mar. 22, 1978, Ser. No. 889,110

The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.

Int. Cl.[2] C08K 5/06

U.S. Cl. 260—33.2 R **24 Claims**

1. A polyether amide-acid-imide solution consisting essentially of

(1) as the sole solvent a liquid hydroxy ether solvent selected from the group consisting of

(i) hydroxyethers having the general formula

$$R^1—(O—CH_2CH_2)—OH$$

where R^1 is a monovalent radical selected from the group consisting of methyl, ethyl, butyl, phenyl and benzyl;

(ii) hydroxy ethers having the general formula

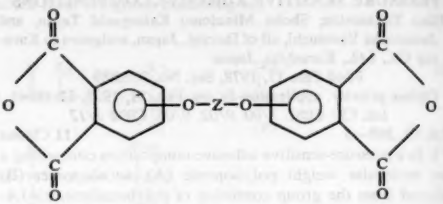
$$R^2—(O—CH_2CH_2—O—CH_2CH_2)—OH$$

where R^2 is a monovalent radical selected from the group consisting of methyl, ethyl, butyl, and phenyl; and

(iii) mixtures of said ether solvents and dissolved in said ether solvent

(2) a polyetheramide-acid-imide having an imide content no greater than the maximum imide content at which the polyetheramide-acid-imide is soluble in the solvent at 20° C. and prepared by reacting

(i) at least one aromatic bis(ether anhydride) having the formula

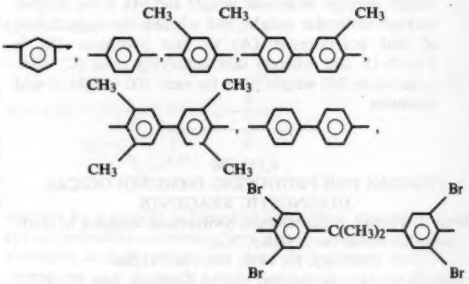


with

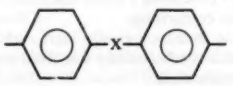
(ii) at least one organic diamine having the formula

$$N_2N—R—NH_2$$

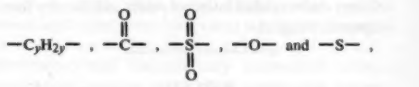
at a temperature and for a time effective to form said polyetheramide-acid-imide, where Z is a member selected from the class consisting of (A) divalent organic radicals having the following formulas



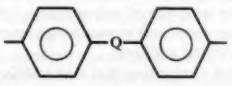
and (B) divalent organic radicals of the general formula



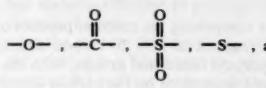
where X is a member selected from the class consisting of divalent radicals of the formulas



where y is an integer from 1 to 5; and R is a divalent organic radical selected from the class consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and divalent radicals of the general formula



where Q is a member selected from the class consisting of



and x is an integer from 1 to 5.

4,181,642

PROCESS FOR THE PRODUCTION OF A GLYCIDYL GROUP CONTAINING ACRYLIC RESIN AND ITS USE

Hans-Joachem Hölle, and Gerhard Morlock, both of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 946,059

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749576

Int. Cl.[2] C08F *8/14, 220/14, 220/32;* **C08L** *00/00*

U.S. Cl. 260—37 EP **24 Claims**

1. A process for the production of a glycidyl group containing acrylic resin suitable in combination with an aliphatic dicarboxylic acid as a binder in a powder varnish, lacquer or enamel comprising bulk polymerizing a mixture of monomers consisting of

(a) 20 to 70 weight % of methyl methacrylate

(b) 10 to 40 weight % of at least one ester of acrylic acid of methacrylic acid with a monohydric alcohol, whose homopolymer has a glass transition temperature below 40° C.

(c) 10 to 25 weight % of glycidyl acrylate or glycidyl methacrylate and

(d) 0 to 50 weight % of an additional ethylenically unsaturated monomer copolymerizable with (a), (b) and (c)

the total of (a), (b), (c) and (d) being 100 weight % in the presence of a radical (free radical) catalyst and in the presence of, based on the weight of the monomer mixture, 0.1 to 3.0 weight % of at least one ester of phosphorous acid having the formula

where R_1 is hydrogen or a saturated aliphatic hydrocarbon group with 1 to 16 carbon atoms, and aryl group with 6 to 10 carbon atoms, an alkyl substituted aryl group with 1 to 12 carbon atoms in the alkyl portion or an aralkyl group with 1 to 18 carbon atoms and R_2 and R_3 are the same or different saturated aliphatic hydrocarbon groups with 1 to 16 carbon atoms, alkyl substituted aryl groups with 1 to 12 carbon atoms in the alkyl portion, aralkyl with 7 to 18 carbon atoms or aryl groups with 6 to 10 carbon atoms.

4,181,643

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE, CROSSLINKED EPOXIDE RESINS

Ursula Kreibich, Riehen, and Rolf Schmid, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 680,264, Apr. 26, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,276

Claims priority, application Switzerland, Apr. 28, 1975, 5444/75

Int. Cl.[2] C08L *63/00, 63/06*

U.S. Cl. 260—40 R **23 Claims**

1. Process for the manufacture of crystalline, crosslinked epoxide resins having at least two different crystallite melting points, characterized in that epoxide compounds, containing two or more epoxide groups, are reacted

(a) with polyester-polycarboxylic acids D which consists essentially of segments of the formula I

$$-[O-(CH_2)_n-O.CO-(CH_2)_m-CO]_p- \quad (I)$$

in which n and m are identical or different and denote 2 or a higher number than 2, and to which the condition $n+m=6$ to 30 applies, and in which p denotes a number from 2 to 40, which, however, is sufficiently large that the segment contains at least 30 —CH_2— groups and

(b) with polyester-polycarboxylic acids E which is different from the polyester-polycarboxylic acid D which consists essentially of segments of the formula II

$$-[O-(CH_2)_s-O.CO-(CH_2)_r-CO]_q-tm \ (II)$$

in which s and r are identical or different and denote 2 or a higher number than 2, and to which the condition $s+r+2 \leqq n+m$ applies, and in which q denotes a number from 6 to 30, which, however, is sufficiently large that the segment contains at least 30 —CH_2— groups, and

(c) if appropriate, with curing agents C, and, if appropriate, in the presence of accelerators, in a ratio such that 0.5 to 1.2 equivalents of polyester-polycarboxylic acid are present per equivalent of epoxide compound, that 1/10 to 9/10 of these 0.5 to 1.2 equivalents are attributable to the polyester-polycarboxylic acid D and the remaining 9/10 to 1/10 to the polyester-polycarboxylic acid E, and that up to 0.6 equivalent of curing agent C is present per equivalent of epoxide compound, with the proviso that, in the cases in which only difunctional epoxide compounds and difunctional polyester-polycarboxylic acids D and E are employed, the epoxide groups must be present in excess and the reaction with a curing agent C is essential.

4,181,644

IMPACT MODIFIED POLYMER COMPOSITION

Marvin H. Lehr, Bath, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 23, 1978, Ser. No. 889,458

Int. Cl.[2] C08K *7/14;* **C08L** *53/00*

U.S. Cl. 260—42.18 **18 Claims**

1. A normally rigid thermoplastic composition comprising (a) a matrix comprising a chlorinated vinyl chloride resin, and (b) a dual function processing aid and impact modifier, or pro-modifier, consisting essentially of a block copolymer of a vinyl aromatic compound (S) and a conjugated diene (D), wherein said vinyl aromatic compound (S) is selected from the group consisting of styrene, α-methyl styrene, vinyl toluene, vinyl xylene, and naphthalene, said conjugated diene (D) is selected from the group consisting of butadiene, isoprene, 1,3-pentadiene, and 2,3-dimethyl butadiene, and said pro-modifier is present in an amount in the range from about 1 percent to about 10 percent by weight based on the total resinous components of said composition.

14. A reinforced composition as defined in claim 1 including a reinforcing amount of fibrous glass.

4,181,645

ROOM-TEMPERATURE CURABLE ELASTIC COMPOSITION

Tatsuo Kinoshita, Yamaguchi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 26, 1978, Ser. No. 954,786

Claims priority, application Japan, Oct. 31, 1977, 52-129663

Int. Cl.[2] C08K *5/15*

U.S. Cl. 260—42.28 **4 Claims**

1. An elastic composition curable at room temperature comprising

(A) a diamine having a molecular weight of about 5,000 to about 25,000 and expressed by the following formula

$$H_2N(R'NH\overset{\overset{\displaystyle O}{\|}}{C}OR O\overset{\overset{\displaystyle O}{\|}}{C}NH)_nR'NH_2$$

wherein R is a residue of a long-chain diol having a molecular weight of about 500 to about 15,000, R' is a group selected from the group consisting of alkylene, cycloalkylene and arylene, and n is an integer of 1 to 25,

(B) a diepoxy compound in an amount such that the ratio of the moles of epoxy groups in the diepoxy compound to the moles of primary amino groups in the diamine (A) is from 0.5 to 5.0,

(C) a mixture of (i) a diacrylic acid ester and/or a dimethacrylic acid ester and (ii) a tri- or higher-polyacrylic acid and/or a tri- or higher polymethacrylic acid ester in which 5 to 90% of the acryloyl and/or methacryloyl groups are derived from the diacrylic and/or dimethacrylic acid ester, the amount of said mixture being such that the ratio of the total moles of the acryloyl and methacryloyl groups in the mixture to the moles of primary amino groups in the diamine (A) is from 0.1 to 2.0,

(D) 0 to about 300 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of an inorganic filler,

(E) a monoepoxy compound in an amount of 0 to 25 moles per mole of the primary amino groups in the diamine (A),

(F) 0 to about 30 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of a curing promotor,

(G) 0 to about 100 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of a viscosity controlling agent,

(H) 0 to about 300 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of an organic filler,

(I) 0 to about 30 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of an age-resister.

(J) 0 to about 30 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of a sag inhibitor,

(K) 0 to about 30 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of an ultraviolet absorbent and

(L) 0 to about 10 parts by weight, per 100 parts by weight of the total of the diamine (A), diepoxy compound (B) and mixture (C), of an assistant sag inhibitor.

4,181,646

PHOSPHORUS-CONTAINING FLAME RETARDANT COMPOSITIONS

Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 820,282, Jul. 29, 1977, abandoned, which is a division of Ser. No. 695,702, Jun. 14, 1976, Pat. No. 4,073,829. This application Jul. 17, 1978, Ser. No. 925,020

Int. Cl.[2] C08K *5/52;* C07F *9/09*

U.S. Cl. 260—45.7 P **8 Claims**

1. The combination of a polyamide together with a polymeric ester comprising the reaction product of (A) an aliphatic alcoholic reactant of 5 to 20 carbon atoms, and having from 2 to 6 hydroxyl functional groups, with the proviso that there is no hydrogen atom on the carbon atoms beta to the hydroxyl oxygen, (B) a pentavalent phosphorus-containing acid halide reactant of 0 to 20 carbon atoms having from 1 to 4 halogen functional groups, and (C) a different alcoholic reactant as defined in (A) or a different phosphorus-containing reactant as defined in (B), the said ester having a degree of aggregation of 2 to 100, and with each of (A), (B), and (C) being present at from 1 mole to 99 mole %, with the proviso that the number of alcoholic functional groups on the alcoholic reactants is equal to the number of the said functional groups on the phosphorus-containing reactants.

2. A polymeric ester comprising the reactant product of (A) an aliphatic alcoholic reactant of 5 to 20 carbon atoms, and having from 2 to 6 hydroxyl functional groups, with the proviso that there is no hydrogen atom on the carbon atoms beta to the hydroxyl oxygen, (B) a pentavalent phosphorus-containing acid halide reactant of 0 to 20 carbon atoms having from 1 to 4 halogen functional groups, and (C) a different alcoholic reactant as defined in (A) or a different phosphorus-containing reactant as defined in (B), the said ester having a degree of aggregation of 2 to 100, and with each of (A), (B) and (C) being present at from 1 mole to 99 mole %, with the proviso that the number of alcoholic functional groups on the alcoholic reactants is equal to the number of the said functional groups on the phosphorus-containing reactants.

4,181,647

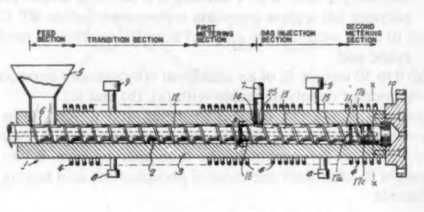
PROCESS FOR EXTRUSION COATING OF A WIRE WITH A CELLULAR THERMOPLASTIC RESIN MATERIAL

Shirley Beach, Vancouver, Canada, assignor to Phillips Cables Limited, Brockville, Canada

Continuation-in-part of Ser. No. 431,495, Jan. 7, 1974, abandoned. This application Oct. 27, 1976, Ser. No. 735,948 Claims priority, application Canada, Jan. 11, 1973, 161082

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—45.9 **11 Claims**



1. A method of preparing a cable conductor wire insulated with a cellular thermoplastic electrically insulating material in extruded form, said method comprising the steps of:

providing a screw extruder of the type including a barrel having mounted therein for rotation a screw effective to advance and shear a mixture of solid particulate polymer material and a discrete particulate material;

providing on the screw combined valve and mixing means effective to convert solid particulate polymer to a polymer melt and to disperse particulate material in the polymer melt wherein the combined valve and mixing means includes at least two closely spaced apart rows of radially disposed pins mounted normal to and circumferentially around the screw to form a ring and wherein the pins of one of the rows is in staggered relationship with the pins of the other of the rows;

providing the screw with a low pressure zone downstream of the valve means followed by a high pressure zone;

providing on the screw downstream of the high pressure zone intense mixing means effective to disperse nucleated gaseous material wherein the intense mixing means includes at least three spaced apart mixing rings disposed radially to the screw and each mixing ring including at least a pair of adjacent rows of radially disposed pins with the pins of each row of a mixing ring being in a staggered relationship with the pins of the adjacent row;

providing an extrusion head for the extruder;

passing a moving conductor wire through the extrusion head;

introducing a mixture of a thermoplastic, electrically insulating, solid particulate polymer material, selected from the group consisting of polyethylene, polypropylene and polyvinylchloride, and a small amount of discrete particu-

late material effective to provide nucleation sites into the extruder barrel;
passing the mixture through the barrel, heating and shearing the mixture in a first upstream portion of the barrel;
advancing the mixture through the barrel towards the combined valve and mixing means and converting the solid particulate polymer to a polymer melt and dispersing the discrete particulate material in the polymer melt;
advancing the polymer melt through said combined valve and mixing means, whereby said melt is divided into streams between the staggered pins, allowing said streams to reunite on emerging from the combined means, whereby the nucleation sites provided by the particulate material are thoroughly distributed throughout said melt;
advancing the polymer melt into the low pressure zone downstream of the combined valve and mixing means while maintaining the shearing;
introducing a gaseous material into the polymer melt in the low pressure zone, and allowing the gaseous material to be nucleated in the polymer melt at the nucleation sites provided by the discrete particulate material;
forcing the resultant mass out of the low pressure zone and into the zone of higher pressure and passing the mass through the intense mixing means and dispersing the nucleated gaseous material in the mass;
forcing the mixture through the extrusion head and about the moving conductor wire in a compressed form and allowing the thus obtained extruded mixture to expand;
and then collecting the conductor wire insulated with the extruder cellular thermoplastic insulating material; said combined valve and mixing means being effective to seal off the upstream portion of the screw extruder to prevent escape thereto of the gaseous material introduced in said low pressure zone.

10. A method of preparing a communication cable comprising a cable conductor wire insulated with a cellular thermoplastic electrically insulating material in extruded form, and an outer conductor and sheath around the wire, said method comprising the steps of:
providing a screw extruder of the type including a barrel having mounted therein for rotation a screw effective to advance and shear a mixture of solid particulate polymer material and a discrete particulate material;
providing on the screw combined valve and mixing means effective to convert solid particulate polymer to a polymer melt and to disperse particulate material in the polymer melt wherein the combined valve and mixing means includes at least two closely spaced apart rows of radially disposed lugs mounted normal to and circumferentially around the screw to form a ring and wherein the lugs of one of the rows is in staggered relationship with the lugs of the other of the rows;
providing the screw with a low pressure zone downstream of the combined valve and mixing means followed by a high pressure zone;
providing on the screw downstream of the high pressure zone intense mixing means effective to disperse nucleated gaseous material wherein the intense mixing means includes at least three spaced apart mixing rings disposed radially to the screw and each mixing ring including at least a pair of adjacent rows of radially disposed lugs with the lugs of each row of a mixing ring being in a staggered relationship with the lugs of the adjacent row;
providing an extrusion head for the extruder;
passing a moving conductor wire through the extrusion head;
introducing a mixture of a thermoplastic, electrically insulating, solid particulate polymer material, selected from the group consisting of polyethylene, polypropylene and polyvinylchloride, and a small amount of discrete particulate material effective to provide nucleation sites into the extruder barrel;
passing the mixture through the barrel, heating and shearing the mixture in a first upstream portion of the barrel;
advancing the mixture through the barrel towards the combined valve and mixing means and converting the solid particulate polymer to a polymer melt and dispersing the discrete particulate material in the polymer melt;
advancing the polymer melt through said combined valve and mixing means, whereby said melt is divided into streams between the staggered lugs, allowing said streams to reunite on emerging from the combined means, whereby the nucleation sites provided by the particulate material are thoroughly distributed throughout said melt;
advancing the polymer melt into the low pressure zone downstream of the combined valve and mixing means while maintaining the shearing;
introducing a gaseous material into the polymer melt in the low pressure zone, and allowing the gaseous material to be nucleated in the polymer melt at the nucleation sites provided by the discrete particulate material;
forcing the resultant mass out of the low pressure zone and into the zone of higher pressure and passing the mass through the intense mixing means and dispersing the nucleated gaseous material in the mass;
forcing the mixture through the extrusion head and about the moving conductor wire in a compressed form and allowing the thus obtained extruded mixture to expand;
and passing a plurality of the cellularly insulated conductor wires from the extruder head to a communication cable assembly stage and applying an outer conductor and sheath around the cellularly insulated wires to form a communication cable, without prior drying of the insulated conductor wires to remove residual moisture from the cellular insulation;
said combined valve and mixing means being effective to seal off the upstream portion of the screw extruder to prevent escape thereto of the gaseous material introduced in said low pressure zone.

4,181,648

CURABLE COMPOSITION

Wolfgang Honsberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1978, Ser. No. 967,780
Int. Cl.[2] C08K *3/10*
U.S. Cl. 260—45.75 N **6 Claims**

1. A curable composition comprising chlorosulfonated polyethylene containing at least about 2 parts per 100 parts chlorosulfonated polyethylene of nickel dibenzyldithiocarbamate.

4. A process for stabilizing a curable chlorosulfonated polyethylene composition which comprises adding at least about 2 parts per 100 parts chlorosulfonated polyethylene of nickel dibenzyldithiocarbamate to said chlorosulfonated polyethylene composition and uniformly mixing the ingredients.

4,181,649

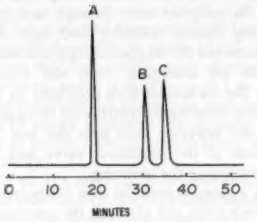
METHOD OF SEPARATING PEPTIDES

Susumu Matsushita, and Tetsuo Ikushige, both of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Apr. 26, 1978, Ser. No. 900,126
Claims priority, application Japan, Apr. 28, 1977, 52-48380
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R **11 Claims**

1. A method of separating peptides by gel permeation chro-

matography which comprises passing a solution of peptides and an eluent through a column containing a cross-linked hard



type starch gel at a pressure of at least 1 kg/cm^2 whereby said peptides are separated.

4,181,650

PROCEDURE FOR THE ASSAY OF PHARMACOLOGICALLY IMMUNOLOGICALLY AND BIOCHEMICALLY ACTIVE COMPOUNDS IN BIOLOGICAL FLUIDS

Charles L. Maier, Jr., P.O. Box 232, Yardley, Pa. 19067

Filed Aug. 25, 1975, Ser. No. 607,151

Int. Cl.^{2} A61K *37/26*; C07C *103/52*; G01N *33/16*

U.S. Cl. 260—112.7 **7 Claims**

1. An insulin-chemiluminescent substance conjugate having luminescent activity measurable by photosensitive means.

4,181,651

METHOD FOR HYDROLYSIS OF CASEIN USING ORTHOPHOSPHOROUS ACIDS OR SALTS THEREOF AND MONTMORILLONITE

Willi Ellenberger, Sandmoorweg 34a, 2000 Hamburg 56, Fed. Rep. of Germany; Holger Blum, Hamburg, Fed. Rep. of Germany; Harald Müller-Zitzke, and Ludwig Mascher, Jr., both of Bodenfelde, Fed. Rep. of Germany, assignors to Willi Ellenberger, Hamburg, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,215

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735297

Int. Cl.^{2} A23J *1/20, 3/02*; C07G *7/00*

U.S. Cl. 260—119 **8 Claims**

1. A method for the hydrolysis of casein which comprises contacting casein with from about one to four gram equivalents of non-oxidizing mineral acid per gram atom of amino nitrogen in the casein at a temperature from 60° to 100° C. in the presence of acid activated montmorillonite and a member selected from the group consisting of orthophosphorous acid, salts of orthophosphorous acid and mixtures thereof.

4,181,652

OZONATED LIGNOSULFONATES

William J. Detroit, Schofield, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 697,541, Jun. 18, 1976, Pat. No. 4,088,640. This application Feb. 7, 1978, Ser. No. 875,854

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.^{2} C07G *1/00*

U.S. Cl. 260—124 R **39 Claims**

1. An ozonated composition comprising a lignosulfonate that has been subjected to ozone oxidation in an aqueous alkaline solution;

said lignosulfonate being first incorporated in an aqueous dispersion containing between about 10 percent and 60 percent by weight of solids;

said dispersion then having incorporated therein a base in an amount of at least 1 percent by weight of said lignosulfonate to form said alkaline solution prior to ozone oxidation;

said lignosulfonate containing between 2 percent and 20 percent by combined oxygen after ozone oxidation by weight of said ozone oxidized lignosulfonate;

said lignosulfonate containing between about 0.5 percent and about 15 percent, based on total unoxidized lignosulfonate, of sulfonic sulfur calculated as sulfur;

said ozone oxidized lignosulfonate including, as its oxidized units, carboxylic and phenolic moieties.

4,181,653

DISPERSE DYES FROM 2-HALO-4,6-DINITROANILINE AND 2(2'-ALKOXY-5'-ALKANOYLAMINOANILINO)ALKANES

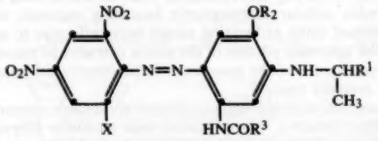
Gary T. Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,530

Int. Cl.^{2} C09B *29/26*

U.S. Cl. 260—207 **7 Claims**

1. A compound of the formula



wherein X is bromo or chloro, R_1 is straight or branched chain alkyl of 2–10 carbons, and R_2 and R_3 are each selected from straight or branched alkyl of 1–4 carbons.

4,181,654

2,3-DIHYDROXYBENZOIC ACID AMIDES OF TETRAAZAALKANES AND TETAAZA CYCLOALKANES

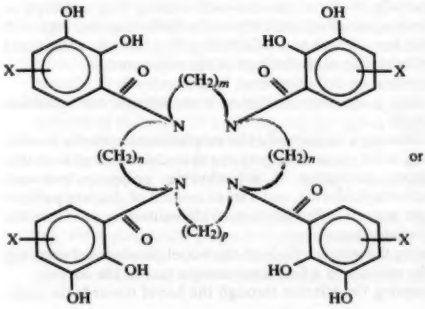
Frederick L. Weitl, Martinez, and Kenneth N. Raymond, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,234

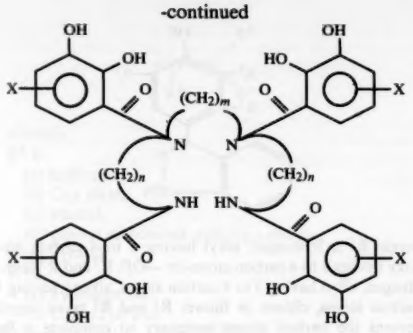
Int. Cl.^{2} C07D *257/02*; C07C *103/87*

U.S. Cl. 260—239 BC **12 Claims**

1. A compound of the formula:



-continued



wherein X is hydrogen, $-SO_3H$ or a salt thereof, or $-NO_2$; n is 2, 3, or 4; m is 2, 3, or 4; and p is 2 or 3.

4,181,655

5(3-SUBSTITUTED AMINOPROPYL)-10-TRIFLUOROMETHOXY-5H-DIBENZ[b,f]AZEPINES

Derek H. R. Barton, London, England, and Robert H. Hesse, Cambridge, Mass., assignors to Research Institute for Medicine and Chemistry Inc., Cambridge, Mass.

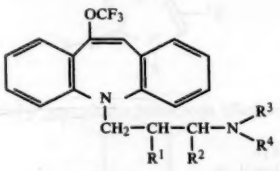
Continuation of Ser. No. 500,189, Aug. 23, 1974, abandoned. This application May 4, 1977, Ser. No. 793,772

Claims priority, application United Kingdom, Aug. 24, 1973, 40242/73

Int. Cl.[2] **C07D** *223/26, 401/06, 403/06, 413/06*

U.S. Cl. 260—239 D **7 Claims**

1. A compound of the formula:



wherein R^1 and R^2 which may be the same or different are hydrogen atom or C_{1-6} alkyl groups; and R^3 and R^4 which may be the same or different represent C_{1-6} alkyl groups which may carry as substituents phenyl or di-C_{1-6} alkylamino groups, R^4 alternatively representing a hydrogen atom; the nucleus of said compound may be unsubstituted or carry at least one substituent selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio and halogen atoms; or a physiologically acceptable acid addition salt thereof.

4,181,656

MANUFACTURE OF SEMI-SYNTHETIC PENICILLIN ANTIBIOTICS

Marco Croci, Milan, and Gino Cotti, Monza, both of Italy, assignors to Glaxo Group Limited, London, England

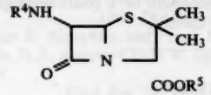
Continuation of Ser. No. 758,311, Jan. 10, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,287

Claims priority, application Italy, Jan. 15, 1976, 47643 A/76

Int. Cl.[2] **C07D** *499/68*

U.S. Cl. 260—239.1 **11 Claims**

1. In a process for the manufacture of a 6-acylaminopenicillanic acid antibiotic product in which 6-aminopenicillanic acid is reacted in an inert organic solvent with from about 1 to about 2 equivalents of a silylating agent relative to the molar quantity of 6-aminopenicillanic acid to form a silylated compound of formula (III)



(III)

wherein R^4 is selected from the group consisting of hydrogen, tri(C_{1-6})alkylsilyl and tri(C_{5-12})arylsilyl and R_5 is selected from the group consisting of tri(C_{1-6})alkylsilyl and tri(C_{5-12})arylsilyl, and the compound of formula (III) is thereafter contacted with an acid chloride or protected acid chloride corresponding to the desired 6-acylamino group at a temperature of from about $+10°$ to about $-30°$ C., the silyl groups are cleaved with water and the desired antibiotic product is recovered, the improvement wherein silylation is effected using a compound selected from the group consisting of formula (I) and formula (II)

$$R^1R^2N.COR^3 \quad \text{(I)}$$

and

$$R^1N{=}C(OR^2).R^3 \quad \text{(II)}$$

wherein R^1 is selected from the group consisting of hydrogen, C_{1-6} alkyl and C_{7-20} aralkyl in formula (I) or C_{1-6} alkyl, C_{7-20} aralkyl, tri(C_{1-6})alkylsilyl and tri(C_{5-12})arylsilyl group in formula (II), R^2 is selected from the group consisting of tri(C_{1-6})alkylsilyl and tri(C_{5-12})arylsilyl and R^3 is selected from the group consisting of C_{1-6} alkyl, C_{7-20} aralkyl and an amino group substituted by one or two C_{1-6} alkyl groups, and the compound of formula (III) produced is reacted without intermediate isolation and without addition of an additional acid acceptor with the acid chloride or protected acid chloride.

4,181,657

2-AMINOOCTAHYDROINDOLO[2,3-A]QUINOLIZINES USEFUL IN TREATING CARDIOVASCULAR DISORDERS

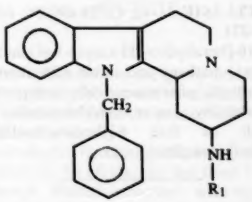
Herbert J. Havera, Edwardsburg, Mich.; Horacio Vidrio, Mexico City, Mexico, and Richard D. Johnson, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 14, 1978, Ser. No. 924,622

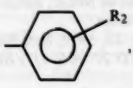
Int. Cl.[2] **A61K** *31/445;* **C07D** *471/04*

U.S. Cl. 424—256 **16 Claims**

16. A therapeutic method of treating angina pectoris in an individual for whom such therapy is indicated, comprising administering to the individual a therapeutically effective amount of a compound having the formula



wherein R_1 is i-propyl, phenyl or a substituted phenyl having the structure



wherein R_2 is halogen, methoxy, lower alkyl, nitro, trifluoromethyl, acetamido or sulfonoamido; or a pharmacologically acceptable acid addition salt thereof.

4,181,658

CERTAIN NICOTINAMIDO-N-BENZOIC ACID DERIVATIVES

Volker Hitzel, Hofheim am Taunus; Rudi Weyer, Kelkheim; Karl Geisen, Frankfurt am Main, and Werner Pfaff, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

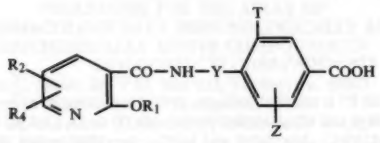
Filed Feb. 16, 1978, Ser. No. 878,602

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706977

Int. Cl.[2] C07D *213/56;* **A61K** *31/44*

U.S. Cl. 424—266 **5 Claims**

1. A compound of the formula



in which

R_1 is alkyl of 2 to 8 carbon atoms; phenalkyl or phenyl which may be substituted by alkyl or halogen; or cycloalkyl, cycloalkylalkyl or alkylcycloalkyl having from 5 to 8 carbon atoms in the ring and up to 3 carbon atoms in the alkyl moiety;

R_2 and T are hydrogen or halogen;

R_4 is hydrogen or methyl;

Y is a single chemical bond or a divalent hydrocarbon of 1 to 3 carbon atoms; and

Z is hydrogen, halogen or methoxy.

5. Treatment of Diabetes mellitus which comprises administering to a diabetic patient a hypoglycemically effective amount of a compound as defined in claim 1.

4,181,659

BIS-PENICILLANOYLOXY-ALKANES

Kai Hansen, Herlev, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

Filed Apr. 4, 1977, Ser. No. 783,984

Claims priority, application United Kingdom, Apr. 15, 1976, 15746/76

Int. Cl.[2] A61K *31/43;* **C07D** *499/00, 499/02*

U.S. Cl. 424—271 **8 Claims**

1. Bis(6-[hexahydro-1H-azepin-1-yl)methyleneamino]-penicillanoyloxy)-methane and stable salts thereof with conventional, non-toxic, pharmaceutically acceptable acids, said salt having a stability greater than the stability of the corresponding salt of free 6-[(hexahydro-1H-azepin-1-yl)-methyleneamino]-penicillanic acid.

4,181,660

3-SUBSTITUTED BENZ[d]ISOTHIAZOLE-1,1-DIOXIDES

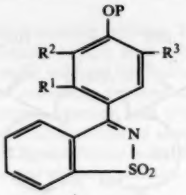
Alan L. Borror, Lexington; Louis Cincotta, Andover; Ernest W. Ellis, Carlisle; James W. Foley, Andover, and Marcis M. Kampe, Brookline, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,024

Int. Cl.[2] C07D *275/06, 417/10;* **C07F** *7/18*

U.S. Cl. 548—110 **23 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or —OP; R^2 and R^3 each are hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro or fluoro; R^1 and R^2 taken together represent the carbon atoms necessary to complete a fused benzene ring; and P is methoxymethyl, 2'-tetrahydropyranyl or dimethyl-t-butylsilyl.

4,181,661

DERIVATIVES OF 2-IMINOTHIAZOLIDINES AND THIAZOLINES

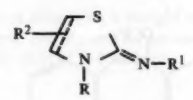
Clarence S. Rooney, Worcester, Pa.; Joshua Rokach, Laval, Canada, and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 773,232, Mar. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 682,876, May 3, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,270

Int. Cl.[2] A61K *31/435;* **C07D** *417/12*

U.S. Cl. 548—195 **9 Claims**

1. A compound of structural formula:



or pharmaceutically acceptable salt thereof, wherein

R is

(1) C_{1-3} alkyl,

(2) C_{3-5} alkenyl, or

(3) C_{3-5} alkynyl;

R^1 is

(1)

wherein R_3 is

(a) C_{1-5} alkyl, substituted with

(i) amino,

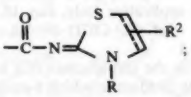
(ii) C_{2-4} alkanoylamino,

(iii) C_{2-4} alkanoylamino and phenyl,

(iv) carboxy,

(v) C_{2-4} alkanoyl, or

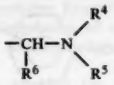
(vi) [carboxamido]



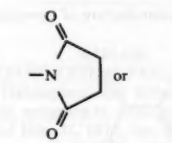
or

(b) pyridyl,

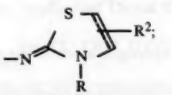
(2)



wherein
R^6 is
(a) hydrogen,
(b) C_{1-5} alkyl,
(c) phenyl,
(d) phenyl substituted with C_{1-3} alkoxy,
(e) pyridyl;
R^4 is
(a) hydrogen, or
(b) C_{1-3} alkyl; and
R^5 is
(a) C_{1-3} alkyl,
(b) $-COR^7$, wherein R^7 is
(i) C_{1-3} alkyl, or
(ii) phenyl; or
R^4 and R^5 taken together with the nitrogen to which they are attached is

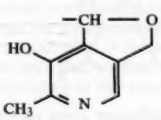


(a)



(b)

(3)



R^2 is
(1) hydrogen,
(2) C_{1-3} alkyl, or
(3) trifluoromethyl.

4,181,662

2-PYRROLIDONE PRODUCTION

W. Alan Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1978, Ser. No. 891,430
Int. Cl.[2] C07D *207/26*
U.S. Cl. 260—326.5 FN **7 Claims**

1. A process for producing 2-pyrrolidone which comprises
(a) contacting succinonitrile with water at a temperature between 150° and 300° C. and a pressure between 100 and 10,000 psig to thereby hydrolyze succinonitrile; and
(b) contacting the hydrolyzed succinonitrile with hydrogen in the presence of a heterogeneous hydrogenation catalyst and at a temperature between 200° and 300° C. and a pressure between 100 and 10,000 psig to thereby obtain 2-pyrrolidone.

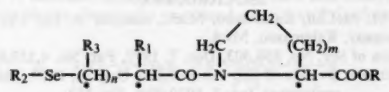
4,181,663

SELENIUM CONTAINING DERIVATIVES OF PROLINE AND PIPECOLIC ACID

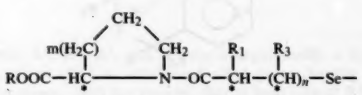
Rudiger D. Haugwitz, and Frank L. Weisenborn, both of Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 29, 1979, Ser. No. 7,070
Int. Cl.[2] C07D *403/12, 207/16*
U.S. Cl. 260—326.25 **13 Claims**

1. A compound of the formula



wherein
R is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl;
R_1 and R_3 each is hydrogen or lower alkyl;
R_2 is hydrogen, lower alkyl, lower alkanoyl, benzoyl, phenyl-lower alkyl, phenyl or



m is 1 or 2; and
n is 0, 1 or 2.

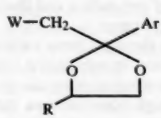
4,181,664

IMIDAZOLE DERIVATIVES AND INTERMEDIATES IN THEIR PREPARATION

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 802,701, Jun. 2, 1977, which is a division of Ser. No. 732,826, Oct. 15, 1976, Pat. No. 4,101,666, which is a continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Jun. 19, 1978, Ser. No. 917,840
Int. Cl.[2] C07D *409/04*
U.S. Cl. 549—60 **1 Claim**

1. A chemical compound having the formula:



wherein:
W is a member selected from the group consisting of halo, 4-methylphenylsulfonyloxy and methylsulfonyloxy;
Ar is a member selected from the group consisting of thienyl and halothienyl; and
R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, pro-

vided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

4,181,665

ISOCHROMAN

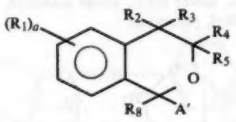
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 858,303, Dec. 7, 1977, Pat. No. 4,153,612, which is a division of Ser. No. 847,350, Oct. 31, 1977. This application Jan. 2, 1979, Ser. No. 312

Int. Cl.[2] C07D *317/44, 311/02*

U.S. Cl. 260—340.5 R **1 Claim**

1. A compound having the formula



wherein

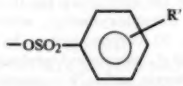
R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_5 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, or R_4 and R_5, are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_5 are hydrogen;

R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

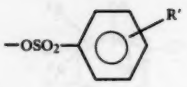
and A′ is selected from the group consisting of $(CH_2)_mOCH_2CH_2B$ and $-(CH_2)_m-(OCH_2CH_2)_qB'$, wherein B is selected from the group consisting of halo, and



wherein

R′ is selected from the group consisting of hydrogen, alkyl of from one to three carbon atoms, nitro, halo and trifluoromethyl;

B′ is selected from the group consisting of halo, hydroxy and



wherein R′ is the same as above, and m is one to three and q is two to three.

4,181,666

PROCESS FOR MAKING FURANONES

Ulrich Huber, Zurich, and Hans J. Wild, Meilen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

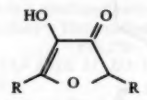
Filed Jul. 26, 1978, Ser. No. 928,136

Claims priority, application Luxembourg, Aug. 11, 1977, 77955; Dec. 14, 1977, 78691

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—347.8 **6 Claims**

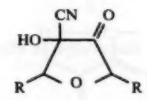
1. A process for the manufacture of compounds of the general formula:



I

wherein R represents a hydrogen atom or the methyl or ethyl group,

which process comprises subjecting a compound of the general formula:



II

wherein R has the significance given earlier in this claim, to the cyanohydrin cleavage, by thermal treatment, at temperatures of about 50° C. to about 400° C., or by treatment with a base, at temperatures of about 50° C. to about 200° C., in the gas phase or in the liquid phase.

4,181,667

PROCESS FOR THE PREPARATION OF FURFURAL

Stig A. Dahlgren, Lidingo, Sweden, assignor to Carbos, AG, Switzerland

Division of Ser. No. 672,296, Mar. 31, 1976, Pat. No. 4,076,733. This application Dec. 19, 1977, Ser. No. 861,876

Int. Cl.[2] C07D *307/50*

U.S. Cl. 260—347.9 **20 Claims**

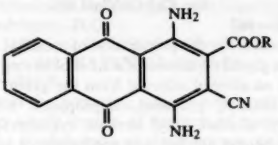
1. A process for the preparation of furfural comprising subjecting a lactose-containing material essentially free of milk proteins to steam distillation under acidic conditions, whereby at least part of the lactose present is converted to furfural, comprising adding an oxidizing agent to said lactose-containing material.

4,181,668
ANTHRAQUINONE DYES

Wolfgang Elser, Wachenheim; Ernst Hartwig, Heidelberg, and Manfred Ruske, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,415
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751835
Int. Cl.[2] C07C *103/75;* C09B *1/20*
U.S. Cl. 260—377 4 Claims

1. An anthraquinone dye of the general formula



where R is linear or branched C_1–C_{10}-alkyl, C_5–C_8-cycloalkyl, alkoxyalkyl of a total of 3 to 11 carbon atoms, phenoxy-C_2–C_4-alkyl or phenyl-C_1–C_4-alkyl.

4,181,669
STEROID ESTERS PREPARATION

Bertil Hansen, Helsingborg, and Krister Holmberg, Molndal, both of Sweden, assignors to Aktiebolaget Leo, Sweden

Filed Dec. 21, 1977, Ser. No. 863,057
Claims priority, application United Kingdom, Dec. 31, 1976, 54544/76
Int. Cl.[2] C07J *71/00, 5/00*
U.S. Cl. 260—397.4 25 Claims

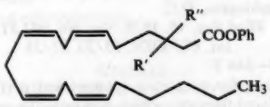
1. In a process for the preparation of a steroid carboxylic acid ester of high purity and in improved yield, comprising reacting in solution a carboxylic acid, a steroid hydroxyl compound which has a cyclopentanophenanthrene carbon-carbon skeleton and contains up to a maximum of 40 carbon atoms and which is selected from the group consisting of steroid alcohols and phenols, and a carbodiimide, in the presence of pyridine or a 3- or 4- lower-alkylpyridine, the improvement which comprises the step of including in the reaction mixture a strong acid.

4,181,670
PHENYL 5Z,8Z,11Z,14Z-EICOSATETRAENOATE AND CONGENERS

Chi-Dean Liang, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 11, 1978, Ser. No. 968,339
Int. Cl.[2] C09F *5/08, 7/10;* C11C *3/00*
U.S. Cl. 260—410.5 10 Claims

1. A compound of the formula



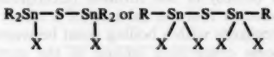
wherein R′ represents hydrogen, 2-alkyl containing fewer than 3 carbons, or 3methyl; R″ represents hydrogen or 2-alkyl containing fewer than 3 carbons except when R′ represents 3-methyl, in which circumstance R″ represents solely hydrogen; and Ph represents phenyl substituted by fewer than 4 alkyls each containing fewer than 5 carbons.

4,181,671
NOVEL ORGANOTIN STABILIZER COMPOSITIONS

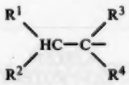
Joseph W. Burley, Wallasey; Ronald E. Hutton, Southport, and Vincent Oakes, Eccleston, all of England, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 742,071, Nov. 15, 1976, Pat. No. 4,134,878. This application Jun. 5, 1978, Ser. No. 912,729
Claims priority, application United Kingdom, Nov. 25, 1975, 48390/75
Int. Cl.[2] C07F *7/22*
U.S. Cl. 260—410.6 5 Claims

1. A stabilizer composition for a polymer, said composition comprising a chemically combined structure of the formula



wherein R is a group having the formula



wherein R^1, R^2, R^3, and R^4 are independently a hydrogen atom, or an alkyl or substituted alkyl group having 1 to 18 carbon atoms, with the proviso that at least one of R^1 and R^2 contains adjacent to the group HC— a carbonyl group which forms a part of an acid group, ester group, acid halide group, ketone group, or aldehyde group; and X is —S(CH-2)$_y$—$COOR^5$ or —S(CH$_2$)$_y$—$OCOR^5$, wherein y is 1 or 2, or —SR^5, —$OCOR^5$ or —OCOCH=CHOOR^5, R^5 being an alkyl or substituted alkyl group having 1 to 18 carbon atoms.

4,181,672
PROCESS FOR PREPARING METAL CHELATES

Felix B. Popper; Jeremiah B. McCarthy, both of Nashua, and James R. Hart, Merrimack, all of N.H., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sep. 27, 1977, Ser. No. 837,249
Int. Cl.[2] C07F *13/00, 3/06*
U.S. Cl. 260—429 J 17 Claims

1. A process for preparing an aqueous solution of a chelate of: (a) at least one metal selected from a first group consisting of: (i) magnesium; (ii) calcium; (iii) zinc; and (iv) manganese(II); and (b) at least one chelating agent selected from a second group consisting of moieties of: (i) ethylenediaminetetraacetic acid; (ii) nitrilotriacetic acid; (iii) diethylenetriaminepentaacetic acid; and (iv) hydroxyethylethylenediaminetriacetic acid; said process comprising:

(A) forming a first admixture by admixing in an aqueous system an oxide or hydroxide of at least one member of the first group and at least one member selected from a third group consisting of: (I) a tetraalkali metal salt of ethylenediaminetetraacetic acid; (II) a trialkali metal salt of nitrilotriacetic acid; (III) a pentaalkali metal salt of diethylenetriaminepentaacetic acid; and (IV) a trialkali metal salt of hydroxyethylethylenediaminetriacetic acid;

(B) admixing the first admixture and a member selected from a fourth group consisting of: (i) ethylenediaminetetraacetonitrile; (II) nitrilotriacetonitrile; and (III) diethylenetriaminepentacetonitrile to form a second admixture;

(C) heating the second admixture to a temperature effective for hydrolyzing the nitrile and evaporating by-product ammonia from the second admixture, and maintaining the second admixture at this temperature for a time effective for hydrolyzing the nitrile and evaporating the by-product ammonia to form a substantially ammonia-free aqueous solution of the chelate; and

(D) adjusting the pH of the resulting substantially ammonia-

free aqueous solution of the chelate to about 5–9.5 and recovering the resulting product.

4,181,673
PROCESS FOR PREPARING DIMETHYLHYDROGENCHLOROSILANE

Hiltraut Schümann, and Christian Dathe, both of Dresden, German Democratic Rep., assignors to VEB Chemiewerk Nunchritz, Nunchritz, German Democratic Rep.

Filed Jan. 23, 1979, Ser. No. 5,713
Int. Cl.[2] C07F 7/16, 7/12
U.S. Cl. 260—448.2 T **9 Claims**

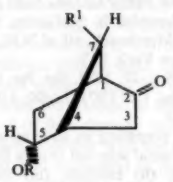
1. A pressureless process for preparing dimethylhydrogenchlorosilane (DMS) of the formula $(CH_3)_2HSiCl$, using as starting product a first-run mixture of a direct synthesis of methylchlorosilanes with a boiling point between 33° and 37° C., the process comprising adding to the starting product hexachloroplatinic acid as a catalyst, and subjecting the mixture to fractional distillation, thereby removing impurities otherwise not separable from the dimethylhydrogenchlorosilane.

4,181,674
5-ENDO-PROTECTED HYDROXYL-BICYCLO[2,2,1]-HEPTAN-2-ONES AND PROCESS FOR PREPARING SAME

Roger F. Newton, Royston; Stanley M. Roberts, Macclesfield; David K. Rainey, Sandy, all of England, and Michael J. Dimsdale, Palaiseau, France, assignors to Allen & Hanburys Limited, London, England

Filed Dec. 2, 1976, Ser. No. 746,740
Claims priority, application United Kingdom, Dec. 3, 1975, 49686/75
Int. Cl.[2] C07F 7/18
U.S. Cl. 260—448.8 R **14 Claims**

1. A compound of the formula



wherein R is acyl, tri(hydrocarbyl)silyl or tetrahydropyranyl and R^1 is an optionally substituted C_{1-12} aliphatic group.

4,181,675
PROCESS FOR METHANOL PRODUCTION

Earle C. Makin, and K. Keith Okamoto, both of Dickinson, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 19, 1978, Ser. No. 943,841
Int. Cl.[2] C07C 29/16
U.S. Cl. 260—449.5 **30 Claims**

1. In a methanol synthesis process wherein methanol is synthesized from a synthesis gas comprising hydrogen and carbon dioxide by passing said synthesis gas over a methanol synthesis catalyst at methanol-forming conditions to form a gaseous mixture including methanol, water and unreacted carbon dioxide, said gaseous mixture is cooled, methanol and water are condensed therefrom and separated from the uncondensed gaseous mixture, a portion of said uncondensed gaseous mixture is removed as purge gas and the remaining uncondensed gaseous mixture is recycled to contact said methanol synthesis catalyst, the improvement comprising contacting said purge gas with the outside surfaces of a plurality of hollow fiber membranes selectively permeable to both hydrogen and carbon dioxide to form a permeant gas stream depleted in hydrogen and carbon dioxide and a permeate gas stream enriched in both said gases, and combining said enriched permeate gas stream with said synthesis gas.

4,181,676
PROCESS FOR THE PREPARATION OF DIALKYL CARBONATES

Hans-Josef Buysch; Heinrich Krimm, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,725
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740243
Int. Cl.[2] C07C 68/06
U.S. Cl. 260—463 **9 Claims**

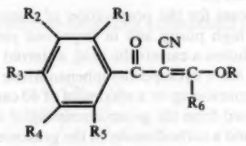
1. In a process for the preparation of a dialkyl carbonate by contacting a glycol carbonate of a 1,2-diol having 2 to 4 carbon atoms with an alcohol selected from the group consisting of methanol, ethanol, propanol, isopropanol, n-butanol, isobutanol, allyl alcohol, amyl alcohol, cyclohexanol, ethylcyclohexanol, benzyl alcohol and methylglycol at an elevated temperature in the presence of an alkali metal or alkali metal compound the improvement which comprises employing less than 0.01 percent by weight of alkali metal or alkali metal compound based upon the weight of the reaction mixture.

4,181,677
2-BENZOYL-3-ALKOXY-2-ALKENONITRILES

John W. Hanifin, Jr., Suffern, and David N. Ridge, Upper Grandview, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 13, 1978, Ser. No. 968,899
Int. Cl.[2] C07C 121/75
U.S. Cl. 260—465 F **6 Claims**

1. A compound of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are each individually selected from the group consisting of hydrogen, halogen, alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms, trifluoromethyl and trichloromethyl with the proviso that at least two of R_1, R_2, R_3, R_4 and R_5 must be hydrogen but R_1, R_2, R_3, R_4 and R_5 may not all be hydrogen; R_6 is alkyl having up to 4 carbon atoms; and R is alkyl having up to 4 carbon atoms.

4,181,678
SYMMETRICAL PERFLUOROALKYLENE OXIDE α,ω-DIACYL FLUORIDES

Theodore Psarras, Gainesville, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 15, 1978, Ser. No. 942,571
Int. Cl.[2] C07C 53/20, 51/58
U.S. Cl. 260—544 F **5 Claims**

1. A process for preparing symmetrical perfluoroalkylene oxide α,ω-diacyl fluorides which comprise the steps of heating a mixture of a diiodide and a catalytic amount of zinc sulfate at a temperature in the range of about 60° to 110° C., the diiodide having the following formula:

$$CF_2ICF_2O(CF_2)_xOCF_2CF_2I,$$

where x is an integer greater than 2; adding fuming sulfuric

acid to the mixture while bubbling chlorine therethrough; and recovering from the mixture a diacyl fluoride having the following formula:

$$FCOCF_2O(CF_2)_xOCF_2COF,$$

where x is an integer greater than 2.

4,181,679

ω-IODOPERFLUOROALKYLENE OXIDE ACYL FLUORIDES

Theodore Psarras, Gainesville, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,943
Int. Cl.² C07C *53/20, 51/58*
U.S. Cl. 260—544 F **4 Claims**

1. A process for preparing ω-iodoperfluoroalkylene oxide acyl fluorides which consists of the steps of heating a mixture consisting of a diiodide and a catalytic amount of zinc sulfate at a temperature in the range of about 60° to 120° C., the diiodide having the following formula:

$$CF_2ICF_2O(CF_2)_xOCF_2CF_2I,$$

where x is an integer equal to at least 2; adding only fuming sulfuric acid to the mixture at a rate such as to maintain a reaction temperature in the range of about 100° to 120° C.; and recovering from the mixture an iodoacyl fluoride having the following formula:

$$CF_2ICF_2O(CF_2)_xOCF_2COF,$$

where x is an integer equal to at least 2.

4,181,680

HYDROGENATION OF AROMATIC AMINES

Walter A. Butte, Jr., West Chester, and Howard P. Angstadt, Media, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Feb. 1, 1979, Ser. No. 8,309
Int. Cl.² B01D *15/06;* B01J *37/00*
U.S. Cl. 260—563 D **8 Claims**

1. A process for the hydrogenation of aromatic bis-methylamines to the corresponding cycloaliphatic compound by hydrogenating the bis-methylamine at a temperature of from about 50° C. to about 150° C., at a pressure of between about 500 and about 2000 psig, in water as a solvent system devoid of added ammonia and in the presence of a supported ruthenium catalyst.

4,181,681

2-AMINO-4-ETHYNYLPHENOL

Robert C. Evers, and George J. Moore, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 19, 1978, Ser. No. 925,899
Int. Cl.² C07C *91/44*
U.S. Cl. 260—575 **2 Claims**

1. 2-Amino-4-ethynylphenol.

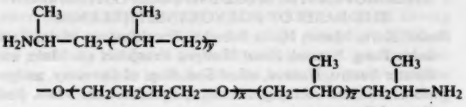
4,181,682

AMINATED PROPOXYLATED POLYBUTANEDIOLS

Lewis W. Watts, Jr., and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,149
Int. Cl.² C07C *93/04, 89/00*
U.S. Cl. 260—584 B **4 Claims**

1. A polymer composition comprising a polymeric amine having the following structural formula:



where x is an average number ranging from about 6 to 50, and y and z are average numbers ranging from about 1 to about 20 with the sum of y and z being from about 6 to about 40.

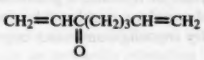
4,181,683

1,7-OCTADIEN-3-ONE AND PROCESS FOR PREPARING THE SAME

Jiro Tsuji, Kamakura, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,362
Claims priority, application Japan, Oct. 11, 1977, 52-120925
Int. Cl.² C07C *49/20*
U.S. Cl. 260—593 R **1 Claim**

1. 1,7-Octadien-3-one of the formula:



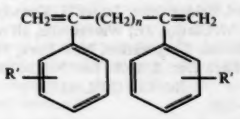
4,181,684

DIPHENYL COMPOUNDS THAT ARE INTERMEDIATES IN PREPARATION OF POLYMERIZATION INITIATORS

Pierre Sigwalt, Saint Michel sur Orge; Patrick Guyot, Paris; Michel Fontanille, Montmorency, and Jean-Pierre Vairon, Paris, all of France, assignors to Societe Chimique des Charbonnages—CdF CHIMIE, Paris, France

Division of Ser. No. 693,730, Jun. 7, 1976, Pat. No. 4,067,917.
This application Aug. 5, 1977, Ser. No. 822,195
Claims priority, application France, Jun. 6, 1975, 75 17716
Int. Cl.² C07C *15/14*
U.S. Cl. 585—25 **3 Claims**

1. An intermediate compound for polymerization initiators, said compound having the formula:



wherein n is between 2 and 10 and R' is hydrogen or an alkyl group having 1 to 5 carbon atoms.

4,181,685

THERMOPLASTIC MOLDING COMPOSITIONS ON THE BASIS OF POLYOXYMETHYLENES

Rudolf Kern, Mainz; Heinz Schmidt, Frankfurt am Main; Karlheinz Burg, Naurod; Ernst Wolters, Frankfurt am Main, and Gunter Sextro, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 217,667, Jan. 13, 1972, abandoned, and Ser. No. 217,668, Jan. 13, 1972, Pat. No. 4,070,415. This application Apr. 14, 1976, Ser. No. 676,927

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1971, 2101817; Oct. 7, 1971, 2150038

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] C08L *59/02*

U.S. Cl. 525—402 17 Claims

1. A thermoplastic molding composition consisting essentially of a mixture of

(A) from 99.9 to 90% by weight of a prestabilized linear polyoxymethylene being

(a) a homopolymer of formaldehyde or of trioxane, the terminal hydroxyl groups of which homopolymer being stabilized against degradation by chemical reaction, or

(b) a copolymer of trioxane and a monofunctionally reacting compound copolymerizable with trioxane, which copolymer has been subjected to a controlled, partial, thermal or hydrolytic degradation down to primary terminal alcohol groups, and

(B) as a nucleating agent for (A) from 0.1 to 10% by weight of a branched or cross-linked polyoxymethylene being

(a) a copolymer of trioxane and a multifunctionally reacting compound copolymerizable with trioxane, or

(b) a copolymer of trioxane, a multifunctionally reacting compound copolymerizable with trioxane and a monofunctionally reacting compound copolymerizable with trioxane,

and being prepared by mixing the components and subsequently homogenizing them in the melt.

4,181,686

CRAZE-RESISTANT POLYSILOXANE RESIN COATINGS AND COATING COMPOSITIONS CONTAINING A DISCONTINUOUS PHASE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 1, 1977, Ser. No. 829,824

Int. Cl.[2] C08L *83/04, 81/04, 81/06*

U.S. Cl. 525—474 14 Claims

1. A coating composition consisting essentially of a cross-linkable polysiloxane resin-forming precondensate and about 5–30% by weight of a particulate organic modifier, based on the combined weight of the precondensate and the modifier,

wherein the modifier has an average particle size in the range of 0.1–15 μm, the modifier is tougher than the cross-linked coating made from the coating composition, and the modifier has higher static coefficient of friction against the polysiloxane resin than does polytetrafluoroethylene, and wherein the polysiloxane resin has a degree of elongation not greater than about 4%.

4,181,687

BONDING THERMOPLASTIC RESINS

Robert J. Ward, Bridgewater; James H. Kawakami, Piscataway, and Neil J. McCarthy, Jr., Warrenville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,437

Int. Cl.[2] C08L *43/04*

U.S. Cl. 525—100 3 Claims

1. An improved thermoplastic resin composition, having excellent bond strength with inorganic oxide substrates, comprising:

(A) a thermoplastic resin;

(B) from about 0.05 to about 10 weight percent, based on the weight of said thermoplastic resin (A) of a copolymer having polymerized therein (i) from 75 to 95 mole percent of at least one ethylenically unsaturated organic monomer and (ii) from 5 to 25 mole percent of at least one unsaturated organosilane monomer of the formula $RSiX_nR'_{(3-n)}$ wherein R is a monovalent organic radical containing a vinyl group, R' is a monovalent hydrocarbon radical containing up to 10 carbon atoms, n is a integer from 1 to 3, and X is a hydrolyzable group chosen from the group consisting of alkoxy of 1 to 4 carbon atoms, alkoxyalkoxy containing up to 6 carbon atoms, acyloxy of 2 to 4 carbon atoms, phenoxy, and oxime; and

(C) from about 0.1 to about 100 mole percent, based on the number of moles of polymerized unsaturated organosilane present in the copolymer component (B) of a monomeric hydrolytically reactive organosilane of the formula $R''_{(4-x)}SiX_x$ wherein X is a hydrolyzable group as previously defined, R'' is a monovalent organic radical of from 1 to 12 carbon atoms and x is a integer having a value of from 1 to 4.

4,181,688

PHENOLIC RESOLS BLENDED WITH N-METHYLOL CARBAZOLES

Joseph G. Robinson, Winchcombe, and Lesley D. Herbert, Stroud, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Nov. 20, 1978, Ser. No. 962,164

Claims priority, application United Kingdom, Nov. 25, 1977, 49115/77

Int. Cl.[2] C08L *61/26, 61/34*

U.S. Cl. 525—390 5 Claims

1. A cross-linkable phenolic resol material comprising 1 part by weight of a N-methylol carbazole and from 1.5 to 5 parts by weight of a phenolic resol.

4,181,689

RESIN COMPOSITIONS CONTAINING MODIFIED POLYPROPYLENE

Kikuo Nagatoshi, Kisarazu; Toshimichi Ito, Sodegaura; Akio Inayoshi, Sodegaura; Atsunobu Sakoda, Sodegaura; Noriki Fujimoto, Sodegaura; Hidehiko Kaji, Sodegaura, and Hirozo Sugahana, Sodegaura all of Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 782,018, Mar. 28, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,364

Claims priority, application Japan, Sep. 14, 1976, 51-109461

Int. Cl.[2] C08F *255/02*

U.S. Cl. 525—419 10 Claims

1. Polyolefin resin composition comprising a polyolefin resin and a modified polypropylene obtained by reacting a polypropylene with a liquid rubber and maleic anhydride in a solvent in the presence of a radical generator.

4,181,690

VENTILATION AND AIR CONDITIONING UNIT

Francis Neu, Villeneuve d'Ascq, France, assignor to S.A. Delta Neu, Lille, France

Filed May 16, 1978, Ser. No. 906,624

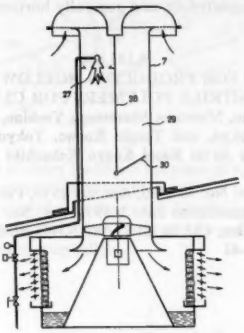
Claims priority, application France, May 18, 1977, 77 16442

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—29 8 Claims

1. Ventilation and air conditioning apparatus operating according to the adiabatic evaporation principle and adapted to be fitted under a roof, said apparatus comprising a prismatic housing of which a bottom portion comprises an annular water-filled tank having in its central portion an upstanding frustoconical element having a vertical axis of which the vertex angle is at least 30 degrees, the major base of said element being connected in an air-tight manner to the tank, the minor base of

this frustoconical element being disposed at the top and closed, and receiving through it a vertical shaft of electric motor means driving a helical fan provided with relatively large blades rotating at a relatively slow speed and adapted to draw in air from a first conduit directing external air to the fan and equipped with an air heater through a second conduit of which at least a lower section is vertical and opens into an upper portion of said housing, an upper section of the second conduit opening into the external atmosphere, said housing having vertical walls with apertures formed therein closed by detach-



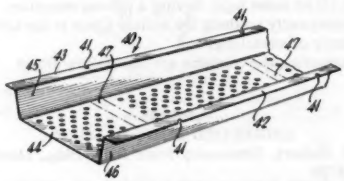
able pockets filled with wood chips to constitute a filtration mat, said pockets being sprinkled continuously with water taken from said water-filled tank by a pump delivering said water continuously in a closed-circuit fashion into an upper conduit, said circuit further comprising on the one hand a water inlet for keeping the water level at a constant value and on the other hand a water recycling valve, said apertures being provided, downstream of the pockets, with a plurality of horizontal louvre blades adapted to be set in any desired inclined position, each blade being mounted for tight-fit pivotal movement about a horizontal axis.

4,181,691

U-BAR FILL

Robert E. Cates, Arnold, and Edward N. Schinner, Silver Spring, both of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Nov. 13, 1978, Ser. No. 960,146
Int. Cl.² B01F *3/04*
U.S. Cl. 261—111 **8 Claims**



1. For use with a crossflow water cooling tower having a hot water distributor for distributing water onto the splash type fill assembly structure, a cold water basin and means for inducing crossflow movement of air therebetween, a combination therewith of splash type fill assembly structure comprising,

a series of elongated generally horizontal fill members;

means supporting the fill members in the space between the hot water distributor and said cold water basin in horizontal and vertical spaced relationship;

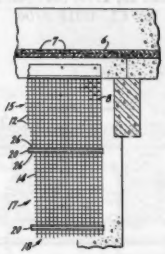
said fill members having their longitudinal axis generally parallel with the direction of air flow and said fill members having two substantially flat imperforated upper surface elements, a lower substantially flat partially imperforate element having intermittent transverse imperforate strips along its length and two vertically elongated imperforated elements one each connecting each upper surface element with the lower substantially flat element for passage and dispersal of liquid falling thereon.

4,181,692

COOLING TOWER FILL ASSEMBLY

Robert D. Stone, Santa Rosa, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Mar. 23, 1979, Ser. No. 23,060
Int. Cl.² B01F *3/04*
U.S. Cl. 261—111 **5 Claims**



1. A unitary elongated plastic generally C-shaped fill hanger splice beam for connecting vertically aligned wire grids in a liquid cooling tower, comprising: a continuous vertical web portion having generally horizontal flanges extending from its upper and lower ends, an upwardly extending leg on the lower flange and a downwardly extending leg on the upper flange, said legs terminating short of each other so as to define a horizontal slot extending the full length of said beam at its center, said legs occupying planes which intersect said vertical web, a plurality of uniformly spaced vertical slits passing through each leg and its associated flange, and the corresponding slits through the upper and lower legs and flanges being aligned vertically.

2. In a cooling tower in which air flows through splash fill within the tower in cooling relationship with a liquid falling through said fill, an improved splash fill assembly comprising:

(a) an upper series of fill hanger grids each comprising generally parallel horizontal strands which intersect and are attached to generally parallel vertical strands so as to form a lattice of holes, the holes defined by horizontally adjacent grids in said series being generally aligned;

(b) means connecting the upper horizontal strands in said upper series of grids to supporting structure in said cooling tower;

(c) a lower series of said fill hanger grids in which the grids are aligned in the same vertical planes with the grids in said upper series, the grids in said lower series being immediately below the grids in said upper series;

(d) a plurality of generally C-shaped fill hanger splice beams each comprising an elongated vertical web portion having generally horizontal flanges extending from its upper and lower ends with an upwardly extending leg on the lower flange and a downwardly extending leg on the upper flange, said legs terminating short of each other so as to define a horizontal slot extending the full length of said beam, a plurality of uniformly spaced vertical slits in each leg, the corresponding slits in the upper and lower legs being aligned vertically;

(e) a splice beam receiving the lowermost horizontal strand of each grid in said upper series beneath the upper flange of said splice beam and being supported thereon, the lower ends of the vertical strands in said upper grid pass-

ing through said vertical slits in said upper leg, the lower flange of said splice beam receiving and supporting the uppermost horizontal strand of the vertically aligned grid in said lower series, the upper ends of the vertical strands in said lower grid passing through said vertical slits in said lower leg; and

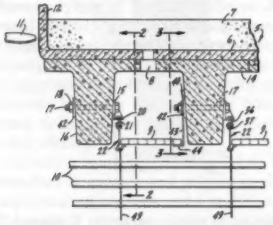
(f) a plurality of generally horizontal elongated splash fill members extending through said aligned holes in each series of grids and being supported on said generally horizontal strands.

4,181,693

COOLING TOWER FILL ASSEMBLY

Joseph K. Swindt, Santa Rosa, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Mar. 23, 1979, Ser. No. 23,108
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—111 **10 Claims**



1. A unitary, elongated, extruded plastic beam for supporting fill hanger grids in a liquid cooling tower, comprising: a vertical web portion extending the length of said beam, a support flange projecting perpendicularly from the upper end of one side of said web portion, there being holes through said flange for receiving means for supporting said beam, a fill hanger grid supporting ledge projecting generally horizontally from the lower end of said side of said web portion, and a perpendicular splash deck supporting projection extending from said web portion between said flange and said web.

3. In a cooling tower in which air flows through splash fill in the tower in cooling relationship with a liquid falling through said fill, an improved splash fill assembly comprising:

(a) a plurality of generally parallel horizontally extending structural beams supporting a hot water basin at the upper end of said tower, liquid distribution openings passing through said basin between adjacent structural beams;

(b) a plurality of brackets fastened to each structural beam at spaced intervals along one side thereof;

(c) an elongated fill hanger support beam extending generally parallel to each structural beam beneath the brackets on such structural beam; a flange extending along the upper end of said fill hanger support beam, a generally horizontal ledge extending along the lower end of said fill hanger support beam, there being a plurality of equally-spaced vertical slits in said ledge, and a generally horizontal shelf on said fill hanger support beam between said flange and said ledge;

(d) vertically adjustable means connecting the flange on each fill hanger support beam to the brackets on its associated structural beam;

(e) a splash deck support beam attached to the opposite side of said structural beams, a generally horizontal shelf extending along the lower end of said splash deck support beam;

(f) the fill hanger support beam and the splash deck support beam on the facing sides of adjacent structural beams being aligned so that their respective shelves define a pair of splash deck support shelves occupying the same generally horizontal plane, a splash deck member supported on each pair of aligned shelves beneath said liquid distribution openings;

(g) a fill hanger grid supported at its upper end by the ledge of each fill hanger support beam, each grid comprising generally horizontal and vertical strands connected so as to define a lattice of holes, said vertical strands passing through said slits, and the holes on adjacent grids being generally aligned beneath said splash deck members; and

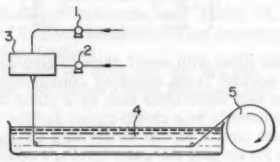
(h) a plurality of generally horizontal splash fill members extending through said aligned holes in said grids and being supported on said generally horizontal strands.

4,181,694

METHOD FOR PRODUCING HOLLOW FIBERS OF ACRYLONITRILE POLYMERS FOR ULTRAFILTER

Yasuo Hashino, Matsudo; Masatsugu Yoshino, Tokyo; Hitoshi Sawabu, Tokyo, and Tsugio Konno, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 354,785, Apr. 26, 1973, Pat. No. 3,871,950.
This application Jan. 3, 1975, Ser. No. 538,253
Int. Cl.[2] B01D *31/00*; B29D *27/00*
U.S. Cl. 264—41 **2 Claims**



1. A method for producing gel-like hollow fibers of acrylonitrile polymers for use as ultrafilters which comprises

(a) dissolving an acrylonitrile polymer containing at least 60% by weight of acrylonitrile units in an aqueous solution of 65–95% by weight nitric acid at a temperature of from 0° C. to −5° C. to prepare a spinning solution,

(b) extruding in the substantial absence of stretching the resulting solution through spinneretts, each having a ring-form orifice, into a coagulation bath having a concentration of up to 30% by weight nitric acid and a temperature from 4°–50° C. and, while extruding, feeding a liquid as an internal coagulant into the central portion of the ring-form orifice to form hollow fibers having (1) an outer layer having a porous structure, (2) a middle layer having voids and (3) an inner layer having a porous structure,

(c) subsequently washing the hollow fibers in the substantial absence of stretching, and

(d) recovering the resulting gel-like hollow fibers.

4,181,695

EMBEDDED BODY IN SOAP

Glenn E. Rickert, Community State Bank Bldg., Huntington, Ind. 46750

Filed Jan. 9, 1978, Ser. No. 867,919
Int. Cl.[2] B29C *17/14*
U.S. Cl. 264—150 **10 Claims**

1. The process of embedding a perforated body in a piece of soap and of aligning said body perforation with a hole at a predetermined location in the soap that connects to the outside surface of the soap comprising the steps of:

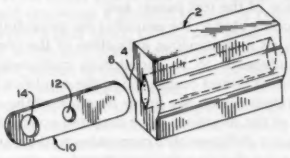
passing a perforated body into a piece of soap along a first axis;

positioning the body perforation inside the soap within a distance of about one half the diameter of said perforation of a predetermined location;

inserting a pointed punch into said soap and the body perforation along a second axis which is transverse to said first

axis to more precisely align said body perforation with said predetermined location; and

penetrating the soap for the additional purpose of providing a precisely located hole in the soap from the soap surface to the body perforation when the punch is inserted into the soap to align the body perforation with the soap hole.



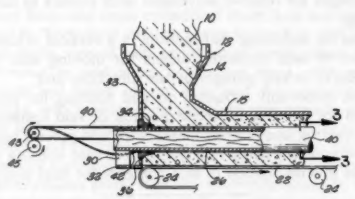
3. The process of claim 1 wherein the piece of soap is formed by severing pieces from extruded soap material to form billets and includes the step of extruding a slot lengthwise of the soap billets in the direction of extrusion to form a perforated body accepting slot in the soap billets.

4,181,696

SLIP-CASED CORE-FORMING MANDREL

Jose A. Mayrl, Centenario 1222, San Pedro Garza Garcia, N. Leon, Mexico

Filed Jan. 30, 1978, Ser. No. 873,186
Claims priority, application Mexico, Nov. 28, 1977, 171488
Int. Cl.[2] B28B *21/06*
U.S. Cl. 264—166 **38 Claims**



32. A method for making a hollow-cored article from a settable mix comprising the steps of:

enclosing at least one hollow elongated, open-ended core-forming mandrel in a casing contacting the interior and exterior wall surfaces thereof and which is in the form of an endless loop which is rotatable past said wall surfaces along the longitudinal axis of said mandrel;

positioning said mandrel in a mold station;

feeding said mix into said mold station and moving said mix relative to the wall surfaces of said mandrel out of said mold station in a first direction; and

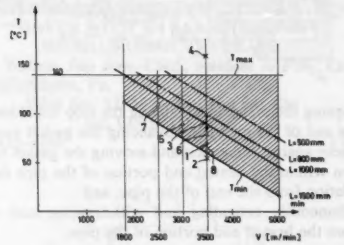
moving said casing on the exterior of said mandrel parallel to said first direction whereby said casing in the interior of said mandrel is moved in the retrograde direction.

4,181,697

PROCESS FOR HIGH-SPEED SPINNING OF POLYAMIDES

Günter Koschinek, Dietzenbach, and Dietmar Wandel, Mühlheim, both of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 670,042, Mar. 24, 1976, abandoned. This application Jun. 8, 1978, Ser. No. 913,893
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2514874
Int. Cl.[2] D01F *7/04*
U.S. Cl. 264—176 F **8 Claims**



1. Process for high-speed spinning and take-up of polyamide spun filaments emerging from spinnerets comprising:

(a) cooling the filaments to a temperature of 50°–90° C.,

(b) passing the cooled filaments through a steamless spinning duct the walls of which are heated to a preselected temperature below 140° C. and above T_{min}, wherein T_{min} is calculated from the following equation:

$$T_{min} = \frac{5500 - v}{33} + T_a \text{ (°C.)}$$

with v=draw-off speed through the spinning duct in m/min, said speed being between 1800 and 5000 m/min and wherein T_a is a constant temperature value of 0 for spinning ducts 1500 mm or greater in length, and a positive constant which is a function of the length of the spinning duct for a duct length less than 1500 mm as follows:

$$T_a = \frac{6(1500 - \text{length of spinning duct in millimeters})}{100},$$

(c) subjecting the heat-treated filaments to a finishing and moistening operation, and

(d) subsequently drawing the filaments off at a speed of between 1800 and 5000 m/min.

4,181,698

METHOD OF BELLING A PLASTIC PIPE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906-10th Ave., Lewiston, Id. 83501

Division of Ser. No. 902,443, May 3, 1978. This application Mar. 19, 1979, Ser. No. 21,587
Int. Cl.[2] B29C *17/00*
U.S. Cl. 264—249 **3 Claims**

1. A method of belling one end portion of a plastic pipe and inserting a gasket therein comprising

heating one end portion of the pipe,

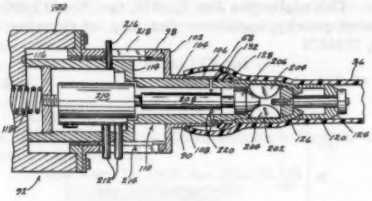
providing a telescoping mandrel having an outer portion with a stop shoulder thereon and a gasket positioning sleeve extended forwardly from the stop shoulder and an inner portion slidably received within said outer portion and having a flared pipe expanding forward portion,

extending the mandrel,

placing a gasket on the inner portion rearwardly of said flared forward portion,

inserting said flared forward portion into the heated end portion of the pipe to radially expand the same, and

radially expand said inner portion forwardly of the gasket,



collapsing the mandrel advancing the stop shoulder against the end of the pipe and advancing the gasket positioning sleeve against the gasket and moving the gasket to a position within the heated end portion of the pipe in spaced relation from the end of the pipe, and

simultaneously extending and withdrawing said mandrel from the heated end portion of the pipe.

4,181,699

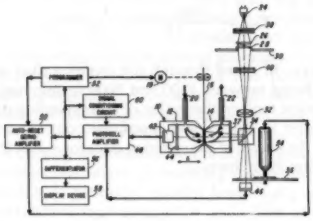
APPARATUS FOR DETECTING THE PRESENCE OF A SPECIFIC SUBSTANCE IN A GAS STREAM

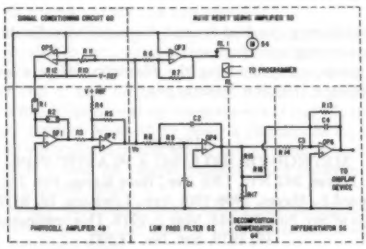
Frank Kitzinger, Montreal, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Mar. 7, 1978, Ser. No. 884,173

Int. Cl.² G01N *21/30*

U.S. Cl. 422—87 **12 Claims**





1. An apparatus for detecting the presence of a specific substance in a gas stream comprising:

(a) a sensing chamber adapted to receive a test paper which is stationary during a monitoring cycle and which is subject to coloration when contacted by a specific substance in a gas stream circulated through said chamber;

(b) a light source;

(c) means responsive to said light source for generating a light beam and directing it toward the reagent paper in the sensing chamber;

(d) a light beam sensing device responsive to the extent to which the test paper in said sensing chamber undergoes coloration in response to exposure to the specific substance in the gas stream;

(e) an amplifier connected to said light beam sensing device for providing an output signal which is proportional to the coloration of the test paper; and

(f) means connected to the amplifier for providing an output which is an instantaneous indication of the concentration of the substance to be monitored, comprising a signal conditioning circuit connected to the amplifier for providing an output which is a linear function of the cumulative amount of the substance to be detected contacting the test paper, and a differentiator responsive to the output of said amplifier for deriving the instantaneous concentration of the substance in the gas stream.

4,181,700

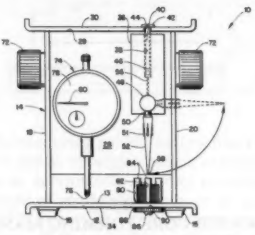
CENTRIFUGE TUBE SEQUENTIAL FRACTIONATOR

Charles H. Chervenka, Sunnyvale, and Lee Gropper, Los Altos Hills, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 3, 1978, Ser. No. 892,625

Int. Cl.² G01N *1/02*

U.S. Cl. 422—102 **13 Claims**



1. A tube fractionator assembly for the sequential fractionation of centrifugated contents in a centrifuge tube, said assembly comprising:

a housing having an enclosed chamber for receipt of a plunger for relative movement with respect to said housing;

means for mounting said housing in a vertical orientation;

means on said mounting means for moving said housing relative to said plunger in one direction; and

means removably mounted on said housing for extracting and for holding a precise portion of said contents, said extracting and holding means with said precise portion of said contents being removable from said housing to store said precise portion of said contents for later analysis.

4,181,701

APPARATUS AND PROCESS FOR THE SYNTHESIS OF AMMONIA

Haldor F. A. Topsøe, Vedbaek, and Erik A. Gam, Humlebaek, both of Denmark, assignors to Haldor Topsøe A/S, Lyngby, Denmark

Filed Mar. 9, 1977, Ser. No. 777,254

Claims priority, application United Kingdom, Mar. 10, 1976, 9452/76

Int. Cl.² B01J *8/04*; C01C *1/04*

U.S. Cl. 422—158 **7 Claims**

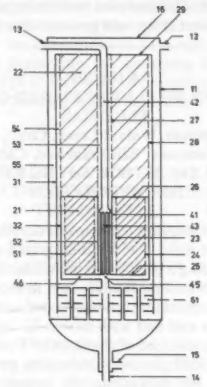
1. A converter for the synthesis of ammonia by passing a process stream of synthesis gas at elevated temperature and pressure through separate catalyst beds contained therein, comprising:

(a) a converter shell of substantially cylindrical shape with its axis in vertical position comprising an outer imperforated shell surface having at its upper end a removable shell closure and having at least two inlet means for introducing feed streams of synthesis gas into said converter, at least one of said inlet means being positioned at the lower end of said converter and at least one outlet means positioned at the lower end of said converter for withdrawing from said converter a product stream of synthesis gas;

(b) an imperforated inner cylindrical sheet concentrically located within said outer shell to provide an annular space for a shell stream to cool said converter shell before forming part of said process stream;

(c) a first catalyst bed of annular shape, mounted in the upper end of said converter concentrically around the axis of said converter shell between an inner perforated wall, an outer perforated wall, said outer perforated wall being spaced from said inner cylindrical sheet, and two annular opposite, horizontal catalyst plates secured to said perforated walls, through which first catalyst bed said process stream, formed by combining said separate feed streams, is inwardly passed in radial direction;

(d) a second catalyst bed of annular shape, mounted in the lower end of said converter concentrically around the axis of said converter shell between an inner perforated wall, an outer perforated wall, said outer perforated wall being



spaced from said inner cylindrical sheet, and two annular opposite, horizontal catalyst plates secured to said perforated walls, one of said annular horizontal plates being connected to said inner cylindrical sheet, said second catalyst bed being longer than said first catalyst bed, through which second catalyst bed said process stream from said first catalyst bed, after having being cooled by indirect heat exchange, is passed in radial direction;

(e) centrally mounted around the axis of said converter shell an intermediate plural tube heat exchange means, in which said process stream from said first catalyst bed is cooled by indirect heat exchange with an exchange stream of synthesis gas before being passed through said second catalyst bed;

(f) means for passing a first feed stream, which is acting as said exchange stream, from one of said inlet means through passageway means to and further through said intermediate heat exchange means to a position on the axis of said converter shell just upstream of said first catalyst bed to form part of said process stream;

(g) means for passing a second feed stream, which is acting as a by-pass stream for adjustment of the temperature of said process stream, said by-pass means extending from another of said inlet means, located at the lower end of said shell, to said position for combination with said first feed stream to form part of said process stream; and

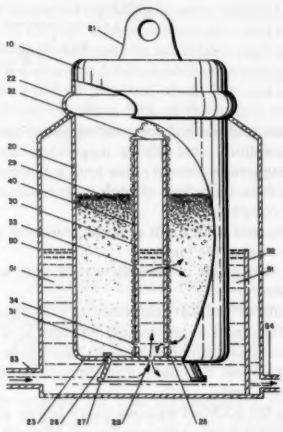
(h) baffle means, said converter shell, and said inner cylindrical sheet providing annular spaces around said first and second catalyst beds for passing said process stream in succession from said position where it is formed by combination of said separate feed streams through said first catalyst bed, said intermediate heat exchanger, and said second catalyst bed to said outlet means.

4,181,702

APPARATUS FOR CONTROLLED CHLORINATION OF WATER WITH AN ALKALI METAL DICHLOROISOCYANURATE

Clyde D. Watson, San Jose, Calif., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 11, 1978, Ser. No. 941,436
Int. Cl.[2] B01D *11/02*
U.S. Cl. 422—265 **9 Claims**



1. Apparatus for dispensing an alkali metal dichloroisocyanurate into a water supply to chlorinate the water, which comprises:

(a) a housing for holding a supply of the alkali metal dichloroisocyanurate, at least the bottom of the housing being in contact with the water to be chlorinated;

(b) a standpipe disposed within the housing, attached at its lower end to the housing bottom and extending upwardly therefrom, (i) the standpipe having at least one solution metering aperture located in its wall proximately to the attached lower end of the standpipe and at least one water inlet aperture located in its wall remotely from the attached lower end, and (ii) access of water from outside the housing to the standpipe interior being provided for by an orifice in the housing bottom;

(c) means on the housing for use in supporting the housing in the water to be chlorinated so as to control the immersion depth of the housing in the water and thereby maintain in normal use water in the standpipe at a level sufficient to cover both the solution metering and water inlet apertures; and

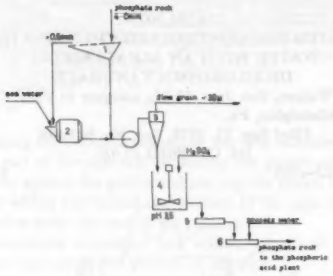
(d) a filter medium covering fitted over the standpipe exterior so as to cover the solution metering and water-inlet apertures in the standpipe wall;

the rate of chlorination being controlled by provision of solution metering apertures of such size and number so as to provide and active chlorine concentration in the water supply of from 0.5 to 5 ppm.

4,181,703
METHOD FOR THE TREATMENT OF PHOSPHATE ROCK

Wilhelm Wengeler, Bochum-Stiepel; Friedrich Wolstein, Essen, and Egbert Hoffmann, Bochum, all of Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 704,436, Jul. 12, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,918
Int. Cl.[2] C01B 25/01
U.S. Cl. 423—167 6 Claims



1. A non-thermal method for treating phosphate rock containing a phosphoric acid-soluble magnesium compound to reduce the magnesium content of the rock and beneficiate it for further use substantially free of such magnesium compounds, said method comprising:

(a) reducing said rock to an average grain size of about 30 microns to about 0.5 mm.,

(b) mixing said grains of phosphate rock with sea water to form a slurry,

(c) acidifying at ambient temperatures said aqueous slurry with sulfuric acid to an acid pH no more acid than 2.5,

(d) maintaining said acidified aqueous slurry in an acid pH of about 3 to about 5 to discourage formation of gelatinous compounds, and

(e) filtering the acidified aqueous slurry before attaining the neutralization point to recover the solid filtrate left by said treated phosphate rock.

4,181,704
PROCESS FOR THE REMOVAL OF SULFUROUS GASES FROM THE EMISSIONS OF CHEMICAL PROCESSES

Charles Sheer, Teaneck, N.J.; Samuel Korman, Hewlett, N.Y., and Gerson S. Schaffel, Belmont, Mass., assignors to Sheer-Korman Associates, Inc., New York, N.Y.

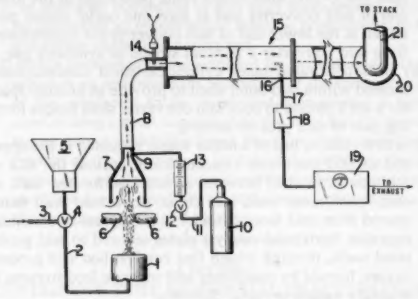
Continuation-in-part of Ser. No. 818,399, Jul. 25, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,204
Int. Cl.[2] C01B 17/16; B01D 53/34
U.S. Cl. 423—230 9 Claims

1. A process for removing sulfurous by-product gases from high temperature reaction products of chemical processes consisting essentially in:

(1) passing a simple or complex metal oxide selected from the group consisting of alkaline earth oxides, oxides of metals having the same or higher valence than alkaline earth metals, and complex metal oxides and silicates containing less than 7% by weight of alkali metal oxides in the form of a coarsely divided powder entrained in a convenient conveying gas through a high energy transfer zone whereby said powder is subjected to temperatures in excess of 2500° K. and sufficiently high to vaporize said powder and said powder is substantially vaporized to form a hot effluent stream containing metal oxide vapor,

(2) injecting said hot effluent stream containing metal oxide vapor into a gaseous reaction product including sulfurous by-product gases, from an elevated temperature chemical process,

(3) allowing said metal oxide vapor to condense to ultrafine, reactive solid particles having a size in the range of 100 to



1000 Angstrom units, which then combine with said sulfurous by-product gases, thereby fixing the sulfur content in the form of solid particles, and

(4) separating said solid particles containing substantially all of said sulfur content from said gaseous reaction product.

4,181,705
PURIFICATION OF FLUIDIZED-BED COMBUSTION FLUE GAS

Raymond J. Gumerman, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 18, 1978, Ser. No. 935,052
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—235 4 Claims

1. In a process including the steps of (1) forming a fluidized bed of particulate solid fuel including at least one nitrogen compound by passing a gas stream including molecular oxygen upwardly through said particulate fuel in a combustion zone, (2) forming NO-containing gaseous combustion products by combusting fuel in said bed with molecular oxygen at an average temperature in said bed of about 1400° F. to about 1800° F., and (3) removing said gaseous combustion products from said bed, the method for decreasing the amount of NO in said gaseous combustion products which comprises:

introducing ammonia or an ammonia-liberating compound into said bed and forming molecular nitrogen from said NO by reacting said ammonia with said NO and oxygen.

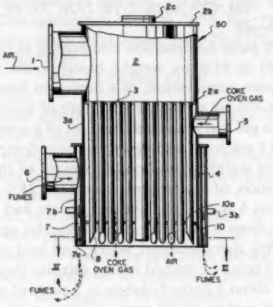
4,181,706
METHOD AND APPARATUS FOR DECOMPOSING AMMONIA FUMES HAVING A HIGH HYDROGEN SULFIDE CONTENT

Gustav Choulat, Recklinghausen; Kurt Lorenz, Hattingen, and Egon Petsch, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still Recklinghausen, Fed. Rep. of Germany

Continuation of Ser. No. 789,682, Apr. 4, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,146
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618027
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—237 1 Claim

1. A method of decomposing ammonia fumes having a high hydrogen sulfide content, in particular, ammonia fumes in the deacidizer fumes from an NH_3—H_2S closed-circuit scrubber of crude coke oven gases, in which the washed-out NH_3 is enriched, comprising burning a heating fuel with an amount of oxygen to generate a stream of combusion gases having a low oxygen content, directing the ammonia fumes in substantially the same direction as the stream of combustion gases and into

close peripheral contact with the stream of combustion gases to heat the ammonia fumes and form a hot mixture of the gases and deacidizer fumes, and directing the hot mixture through a decomposition zone to decompose the ammonia fumes, whereby a formation of organic sulfur compounds from the deacidizer fumes is reduced, including using combustion air for burning the heating fuel with the oxygen which has a water



vapor content of 50% by volume, directing the combustion air with the water vapor content into association with the fuel to form an air-steam mixture, regulating the velocity of the air-steam mixture at the burner outlet to a rate of 8 meters per second and then permitting the ammonia fumes containing NH_3, HCN and H_2S to mix with the combustion gases which are formed by the burning which have a low oxygen content.

4,181,707

DIOLEFIN DIMERIZATION CATALYST AND METHOD FOR PRODUCING NITROSYL HALIDES OF IRON TRIAD METALS

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 817,471, Jul. 20, 1977, Pat. No. 4,144,278. This application Nov. 29, 1978, Ser. No. 964,326

Int. Cl.[2] C01B *21/52*

U.S. Cl. 423—386 **41 Claims**

1. A method for the production of a nitrosyl metal halide comprising reacting an iron triad metal dihalide selected from the group consisting of iron dihalide and cobalt dihalide, wherein the halide is selected from the group consisting of chloride, bromide, and iodide, with at least one alkali metal nitrite in a liquid in which said iron triad metal dihalide is at least partially soluble, under reaction conditions suitable for yielding said nitrosyl metal halide.

33. A method for the production of a nitrosyl metal halide comprising reacting an iron triad metal dihalide selected from the group consisting of iron dihalide, cobalt dihalide, and nickel dihalide, wherein the halide is selected from the group consisting of chloride, bromide, and iodide, with an alkali metal nitrite in a liquid in which said metal dihalide is at least partially soluble and in the presence of at least one elemental metal selected from the group consisting of the corresponding iron triad metal and zinc under reaction conditions suitble for yielding said nitrosyl metal halide.

4,181,708

RUMEN-STABLE PELLETS

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 830,300, Sep. 2, 1977, abandoned, and Ser. No. 830,301, Sep. 2, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,301

Int. Cl.[2] A61K *9/22, 9/32, 9/36*

U.S. Cl. 424—19 **23 Claims**

1. A pellet adapted for oral administration to a ruminant comprising a core material beneficial to the ruminant postruminally, and a coating surrounding said core material which protects the core material in the rumen and releases it in the abomasum, said coating comprising

(a) a physiologically acceptable film-forming polymeric material comprising a polymer, copolymer or mixture thereof having a molecular weight of about 5000-300,000, said polymeric material having basic amino groups the nitrogen content of which constitutes between about 2 and about 14% by weight, of the polymeric material,

(b) from about 5 to 50%, based on the weight of said polymeric material, of a hydrophobic material dispersed in said polymeric material selected from the group consisting of waxes, resins, polymers, fatty acids having from 12 to 32 carbon atoms, aluminum salts of fatty acids having from 12 to 32 carbon atoms, and polyfunctional carboxylic acids having a ratio of from 10 to 22 carbon atoms per carboxyl group and a molecular weight of from 400 to 1000. and

(c) from about 10 to 200%, based on the weight of said polymeric material, of a physiologically acceptable flake material dispersed in said polymeric material,

said polymeric material in combination with said hydrophobic substance being physiologically acceptable and resistant to a pH of greater than about 5 but capable of releasing the core of the pellets at a pH of less than about 3.5, and said coating making up about 5 to about 50% of the weight of said pellet, and having a sticking temperature of at least about 50° C.

4,181,709

RUMEN-STABLE PELLETS

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,281

Int. Cl.[2] A61K *9/24, 9/32, 9/36*

U.S. Cl. 424—21 **19 Claims**

1. A pellet adapted for oral administration to a ruminant comprising a core material having a pH greater than about 5.68, said core material being beneficial to the ruminant post-ruminally, and a coating surrounding said core material which protects the core material in the rumen and releases it in the abomasum, said coating comprising

(a) a film-forming polymeric material containing at least one basic amino group in which the nitrogen content is from 3 to 14% by weight of the total molecular weight of the polymeric material, said polymeric material comprising cellulose propionate morpholinobutyrate, or at least one polymer, copolymer or blend of polymers derived from monomers selected from 2-vinylpyridine, 4-vinylpyridine, 2-methyl-5-vinylpyridine, and 2-ethyl-5-vinylpyridine,

(b) from about 2 to about 40% based on the weight of said polymeric material, of a hydrophobic material dispersed in said polymeric material selected from fatty acids having from 12 to 32 carbon atoms, aluminum salts of fatty acids having from 12 to 32 carbon atoms, or polycarboxylic acids having a ratio of from 10 to 22 carbon atoms per carboxyl group and a molecular weight of from 400 to 1000,

(c) from about 10 to about 200%, based on the weight of said polymeric material, of a physiologically acceptable flake material dispersed in said polymeric material, and

(d) from about 5 to about 40% by weight based on the weight of said polymer, of a reactive fatty acid,

said coating making up about 5 to about 50% of the weight of said pellet, and having a sticking temperature of at least about 50° C.

4,181,710
RUMEN-STABLE PELLETS

Clarence C. Dannelly; Richard E. Ardell, and Gary E. Paar, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 830,283, Sep. 2, 1977, abandoned, and Ser. No. 830,284, Sep. 2, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,223

Int. Cl.[2] A61K *9/58, 9/32*

U.S. Cl. 424—33 **18 Claims**

1. A pellet adapted for oral administration to a ruminant comprising a core material having a pH greater than about 5.5, said core material being beneficial to the ruminant postruminally, and a coating surrounding said core material which protects the core material in the rumen but releases it in the abomasum, said coating comprising

(a) a film-forming polymeric material comprising a polymer, copolymer or mixture thereof having a molecular weight of about 5000–300,000, said polymeric material having basic amino groups the nitrogen content of which constitutes between about 2 and about 14% by weight of the polymeric material,

(b) a hydrophobic material dispersed in said polymeric material selected from waxes, resins, polymers, fatty acids having from 12 to 32 carbon atoms, aluminum salts of fatty acids having from 12 to 32 carbon atoms, and polyfunctional carboxylic acids having a ratio of from 10 to 22 carbon atoms per carboxyl group and a molecular weight of from 400 to 1000,

said polymeric material in combination with said hydrophobic substance being physiologically acceptable and resistant to a pH of greater than about 5 but capable of releasing the core of the pellets at a pH of less than about 3.5, said hydrophobic material being present in an amount between about 5 and about 50% of the weight of the polymeric material, and said coating making up about 5 to about 50% of the weight of said pellet and having a sticking temperature of at least about 50° C.

4,181,711
SEALING MATERIAL

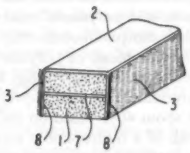
Nozomu Ohashi; Okimasa Yamamuro; Takasuke Asakura, and Akira Nakagawa, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Continuation of Ser. No. 821,011, Aug. 1, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 972,172

Claims priority, application Japan, Jul. 30, 1976, 51-103017[U]; Jun. 10, 1977, 52-69062

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—40 **8 Claims**



1. A sealing material in a roll form comprising

a sealing strip which is prepared by molding a sealing rubber composition having a Mooney viscosity ML 1+4 (100° C.) of about 7 to 50 comprising synthetic rubbers as the major component, and

a peeling tape overlying one surface of the sealing strip, the peeling tape having substantially the same width as the sealing strip and being provided with low adhesiveness on both sides thereof,

wherein one or both edges of the sealing strip are flocked with short fibers with or without a bonding layer, whereby deformation of the edge of the sealing strip wound in a roll form is prevented and contact of the sealing strip at the sides thereof is prevented.

4,181,712
TOOTH PASTE COMPOSITION

Giorgio Rialdi, 18, Via P. Semeria, I-16131 Genova, Italy

Continuation-in-part of Ser. No. 768,199, Feb. 14, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,493

Int. Cl.[2] A61K *7/16, 7/26, 33/44*

U.S. Cl. 424—49 **6 Claims**

1. A tooth paste composition comprising in combination:

(a) from 91 to 97% by weight, based on the weight of the tooth paste composition, of a detergent base; and

(b) from 3–9% by weight of a mixture of micronized colloidal silica gel and activated charcoal of a grain size of from 0.2 to 0.3 microns; said detergent base comprising from 1 to 3% by weight, based on the weight of the tooth paste composition, of a detergent, from 23 to 28% of an humectant, from 6 to 9% of flavoring agents and aromatic improvers, from 0.5 to 1.5% of a germicidal agent, and from 50 to 55% demineralized water; and said silica and said charcoal being contained in said mixture thereof in a ratio of from about 1 part of carbon to 2 parts of silica to about 1 part of carbon to 20 parts of silica, with said mixture containing from about 40 to about 80% by weight of demineralized water.

4,181,713
ISOLATION OF HB_sAG

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 30, 1978, Ser. No. 955,863

Int. Cl.[2] A61K *39/00, 39/12, 39/42*

U.S. Cl. 424—86 **2 Claims**

1. A method for isolating HB_sAg comprising injecting highly purified HB_sAg antigen into a susceptible animal species to stimulate formation of HB_sAb-positive serum, recovering the serum from the animal, treating the serum to separate a globulin fraction containing HB_sAb, further purifying the HB_sAb in the fraction by chromatographic separation, coupling the purified HB_sAg to a linear polysaccharide in the form of a fixed bed, contacting the HB_sAb in the fixed bed with HB_sAg-positive plasma thereby forming an HB_sAb-HB_sAg immune couplex, and separating HB_sAg from the complex.

4,181,714
ANTIBIOTICS BACILEUCINES A AND B AND PROCESS FOR PRODUCTION AND USE THEREOF

Tomomasa Misato, Tokyo; Keido Ko, Asaka; Yumiko Adachi, Kamifukuoka, and Tadakazu Watanabe, Yokosuka, all of Japan, assignors to Kikagaku Kenkyusho, Wako and Ajinomoto, Kyobashi, both of, Japan

Filed Mar. 7, 1978, Ser. No. 884,254

Claims priority, application Japan, Mar. 11, 1977, 52-26771

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **16 Claims**

1. An antibiotic, Bacileucine A, which has a specific antimicrobial spectrum to pathogenic bacteria of plants and is an acidic substance characterized by the following physicochemical properties: elementary analysis values of C=56.28%, H=8.10%, N=9.20%, S=0.25% and O=26.22%, a molecular weight of 13,000, an infrared absorption spectrum having absorption bands at wave numbers of 3300, 3055, 2960, 2930, 2875, 1740, 1660, 1540, 1460, 1390, 1370, 1280, 1240, 1200 and 1170 cm^{-1}, such a solvent solubility that the antibiotic is soluble in water but insoluble in organic solvents, such coloring reaction characteristics that the antibiotic is positive to Folin's reagent and biuret reaction and negative to Molisch reaction and ninhydrin reaction, and an isoelectric point at a pH of 5.2 (±0.2).

4,181,715
NOVEL ANTIBIOTIC SUBSTANCE SF-1540 AND ITS DERIVATIVE, AND PROCESS FOR THE PRODUCTION THEREOF

Yasumitsu Kondo; Takashi Shomura; Hiroshi Watanabe; Tetsuro Watanabe; Shigeharu Inouye, and Taro Niida, all of Yokohama, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 751,437, Dec. 16, 1976, abandoned. This application May 24, 1978, Ser. No. 908,983
Claims priority, application Japan, Dec. 29, 1975, 50/157469; Apr. 19, 1976, 51/43659
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 **7 Claims**

1. An antibiotic substance SF-1540 which has the following physicochemical properties:
an optical rotation of $[\alpha]_D^{20} = +31.6°$ in methanol,
an elementary analysis of 65.16% carbon, 8.24% hydrogen, 2.17% nitrogen and 23.79% oxygen,
an ultraviolet absorption spectrum shown in FIG. 1, an infrared absorption sprectrum shown in FIG. 2 and a nuclear magnetic resonance spectrum shown in FIG. 3,
a color reaction positive to potassium permanganate and sulfuric acid and negative to ninhydrin,
sparingly soluble in water and cyclohexane, and soluble in methanol, ethanol, acetone, chloroform, ethyl acetate, n-butanol, benzene, carbon tetrachloride and ethyl acetate.

5. A derivative of the antibiotic substance SF-1540 as defined in claim 1 which has the following physicochemical properties:
an optical rotation of $[\alpha]_D^{20} = +21°$ in chloroform,
an elementary analysis of 66.69% carbon, 8.62% hydrogen, 1.68% nitrogen and 23.96% oxygen,
an ultraviolet absorption spectrum shown in FIG. 4, an infrared absorption spectrum shown in FIG. 5 and a nuclear magnetic resonance spectrum shown in FIG. 6,
a color reaction positive to potassium permanganate and sulfuric acid and negative to ninhydrin,
sparingly soluble in water, and soluble in methanol, ethanol, acetone, chloroform and ethyl acetate.

4,181,716
ANTIBIOTICS

Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 704,786, Jul. 13, 1976, abandoned, which is a division of Ser. No. 559,973, Mar. 19, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,947
Claims priority, application United Kingdom, Mar. 28, 1974, 13855/74
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—124 **8 Claims**

1. A process for the preparation of the di-sodium or dipotassium salt of MM 4550A which is at least 70% pure wherein MM 4550A is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_9N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:
(a) in aqueous solution, it has a characteristic ultraviolet spectrum with absorption maxima at about 238 nm and at about 287 nm;
(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum substantially as shown in FIG. 2 and has absorption maxima at inter alia about 3450, 2950, 1765, 1695, 1510, 1390 and 1260 cm^{-1};
(c) it has a characteristic n.m.r. spectrum when when taken in D_2O is substantially as shown in FIG. 3, which spectrum possesses inter alia (i) a pair of low field doublets centred approximately at 2.45τ and 3.65τ with coupling constacts of approximately 15 Hz; (ii) a doublet centred at approximately 8.55τ; and (iii) a sharp singlet at approximately 7.95τ;
(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Acinetobacter antiratus, Serratia marcescens* and *Shigella sonnei;*
(e) it synergises the antibacterial activity of ampicillin against certain β-lactamase producing bacteria including strains of *Escerichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morgan i* and *Staphylococcus aureus* Russell; and
(f) it is not a polypeptide or protein; which comprises chromatographically purifying a solution of MM 4550 (Complex) by passing a solution of MM 4550 (Complex) in an aqueous lower alkanol through a bed of cellulose, collecting those fractions having a UV absorption maxima at about 238 nm and about 287 nm and removing the solvent from the solution at a temperature below 30° C.

4,181,717
OVULATION ENHANCING PEPTIDES

Harry A. Kent, Jr., Piscataway, N.J., assignor to Research Corporation, New York, N.Y.

Filed Sep. 7, 1978, Ser. No. 940,451
Int. Cl.[2] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **22 Claims**

1. Polypeptides containing four amino acids, which are:
1. selected from the group consisting of threonine, serine, arginine, lysine, ornithine and histidine;
2. formed in a tetrapeptide unit, the amino terminus of which is the amino acid threonine or serine, said threonine or serine being formed in a peptide bond through its carboxyl group to the α-amino group of arginine or lysine;
3. the remaining two amino acids in said tetrapeptide unit being selected from the group consisting of arginine, lysine, ornithine and histidine;
and pharmacologically acceptable salts thereof.

4,181,718
POLYANION-STABILIZED ALUMINUM HYDROGELS

Norbert S. Mason, 725 Langton Dr., Clayton, Mo. 63105, and Robert E. Sparks, 1318 W. Adams Ave., Kirkwood, Mo. 63122

Continuation of Ser. No. 645,100, Dec. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 560,220, Mar. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 331,151, Feb. 9, 1973, abandoned. This application Feb. 13, 1978, Ser. No. 877,504
Int. Cl.[2] A61K *31/715, 31/725, 33/06*
U.S. Cl. 424—180 **15 Claims**

1. A non-astringent phosphate binding agent having a high phosphate binding capacity which capacity is maintained upon dehydration comprising a stabilized hydrogel of an aluminum salt and a carboxy-containing polymeric anion having a molecular weight of from 1,000 to 700,000, with the hydrogel formed at a pH below about 7.

2. The phosphate binding agent of claim 1 wherein the aluminum salt is aluminum acetate and the polymeric anion is selected from the group consisting of gum arabic and carboxymethyl cellulose.

13. A method of treating hyperphosphatemia, which comprises administering to a mammal in need of such treatment a hyperphosphatemic effective amount of a phosphate binding agent of claim 1.

4,181,719

ANALGESIC N-ACETYL-PARA-AMINOPHENYL N'-ACETYLAMINOTHIOALKANOATES

George Margetts, Billingshurst; Roderic S. Andrews, Newcastle-upon-Tyne, both of England, and Jean Legros, Dijon, France, assignors to Sterling Drug Inc., New York, N.Y.

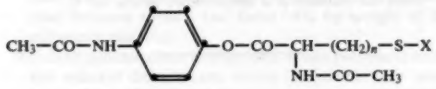
Filed May 26, 1978, Ser. No. 909,846

Claims priority, application United Kingdom, May 26, 1977, 22218/77

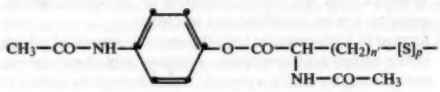
Int. Cl.[2] A61K *31/22, 31/615;* C07C *67/08*

U.S. Cl. 424—233 14 Claims

1. N-acetyl-para-aminophenyl N'-acetylaminothioalkanoate having the general formula

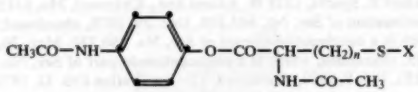


wherein n is 1 or 2, X is a hydrogen atom, a methyl group or a grouping of general formula

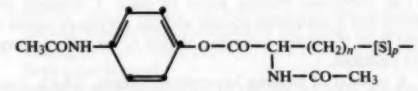


wherein n' is 1 or 2 and p is zero or 1, in the form of its D or L isomer or mixtures thereof.

9. Pharmaceutical composition for use as an analgesic containing a pain relieving effective amount of one or more of the N-acetyl-para-aminophenyl N'-acetylaminothioalkanoates having the general formula



in which n is 1 or 2, and X is a hydrogen atom, a methyl group or a grouping of general formula



wherein n' is 1 or 2, and p is zero or 1 as claimed in claim 1, in association with a suitable pharmaceutical vehicle.

4,181,720

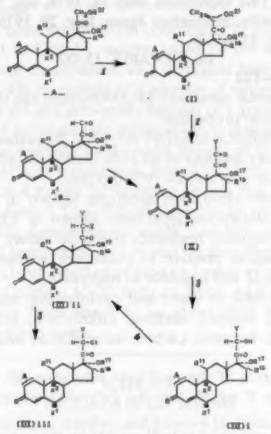
CORTICOSTEROID ANTIINFLAMMATORY AGENTS

Michael Marx, Sunnyvale, and Denis J. Kertesz, Mountain View, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

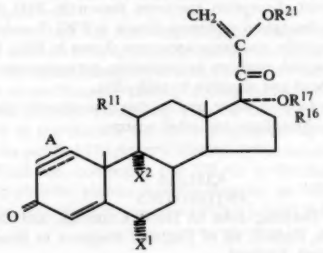
Filed Apr. 5, 1978, Ser. No. 893,631

Int. Cl.[2] A61K *31/58, 31/56;* C07J *71/00*

U.S. Cl. 424—241 41 Claims



1. A compound of the formula



(I)

wherein

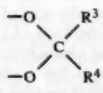
R^{11} is chloro or hydroxy;

X^1 and X^2 independently are halo selected from the group chloro and fluoro;

R^{16} is methyl;

R^{17} independently is hydrogen, benzoyl or C_2 to C_6 linear or branched acyl; or

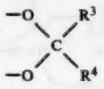
R^{16} and OR^{17} taken together are the radical



where R^3 hydrogen, C_1 to C_5 linear or branched alkyl, phenyl and R^4 is the same or different than R^3 as defined above or is C_1 to C_6 linear or branched alkoxy or R^3 and R^4 taken together with the carbon atom of said radical are C_5 to C_{10} cycloalkyl or C_4 to C_9 heterocyclic alkyl having one heterocyclic atom selected from the group oxygen, nitrogen and sulfur optionally substituted with methyl or ethyl;

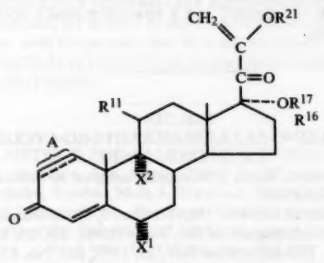
R^{21} independently is C_1 to C_6 linear or branched alkyl or C_4 to C_9 heterocyclic alkyl having one heterocyclic atom selected from the group oxygen, nitrogen and sulfur optionally sub-

stituted with methyl or ethyl; or OR^{17} and OR^{21} taken together are the radical



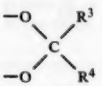
where R^3 is defined above and R^4 is C_1 to C_6 linear or branched alkoxy;
and A is a single or double bond.

34. A pharmaceutical composition useful for treating inflammatory disorders comprising a pharmaceutically acceptable non-toxic carrier in admixture with an effective amount of a compound having the formula:

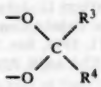


(I)

wherein
R^{11} is chloro or hydroxy;
X^1 and X^2 independently are halo selected from the group chloro and fluoro;
R^{16} is methyl;
R^{17} independently is hydrogen, benzoyl or C_2 to C_6 linear or branched acyl; or
R^{16} and OR^{17} taken together are the radical



where R^3 is hydrogen, C_1 to C_5 linear or branched alkyl or phenyl and R^4 is the same or different than R^3 as defined above or is C_1 to C_6 linear or branched alkoxy or R^3 and R^4 taken together with the carbon atom of said radical are C_5 to C_{10} cycloalkyl or C_4 to C_9 heterocyclic alkyl having one heterocyclic atom selected from the group oxygen, nitrogen and sulfur optionally substituted with methyl or ethyl;
R^{21} independently is C_1 to C_6 linear or branched alkyl or C_4 to C_9 heterocyclic alkyl having one heterocyclic atom selected from the group oxygen, nitrogen and sulfur optionally substituted with methyl or ethyl; or OR^{17} and OR^{21} taken together are the radical



where R^3 is defined above and R^4 is C_1 to C_6 linear or branched alkoxy;
and A is a single or double bond.

4,181,721

DEPOT PREPARATIONS IN AN OILY, UNSATURATED SOLUTION FOR INTRAMUSCULAR INJECTION

Ulrich Speck; Erwig Pinter; Ursula Lachnit-Fixson, and Johann-Diederich Hahn-Godeffroy, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 735,397, Oct. 26, 1976, abandoned. This application Jul. 7, 1978, Ser. No. 922,475
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2548413
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 **36 Claims**

1. In the intramuscular injection into a living mammal of a depot preparation comprising a progestationally effective amount of a lipophilic, physiologically hydrolyzable 17α-ethynyl-19-nortestosterone carboxylic acid ester having progestational activity dissolved in an oily, unsaturated carrier which is a mixture of castor oil and benzyl benzoate which imprats a depot effect to the progestational activity for a desired period of time of at least several weeks, the improvement wherein the amount of said steroid ester is 50–500 mg and the amount of carrier is increased to 1–6 ml whereby said increased amount of carrier extends the progestational activity of the ester to at least 13 weeks.

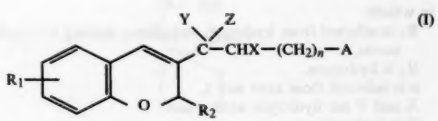
4,181,722

CHROMENE DERIVATIVES USEFUL AS BRONCHODILATORS AND ANTI-ARRHYTHMICS

Serge Beranger, Bretigny-sur-Orge, and Henri Pinhas, Paris, both of France, assignors to Laroche Navarron S.A., Puteaux, France

Filed May 1, 1978, Ser. No. 901,834
Claims priority, application United Kingdom, May 9, 1977, 19351/77
Int. Cl.[2] A61K *31/495, 31/35;* C07D *311/58, 405/06*
U.S. Cl. 424—250 **8 Claims**

1. A compound selected from compounds of the general formula:

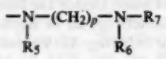


(I)

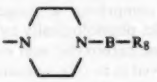
in which:
R_1 is selected from hydrogen and alkoxy having 1–7 carbon atoms,
R_2 is hydrogen,
n is selected from zero and 1,
X and Y are hydrogen atoms, and
Z is hydroxy, or
Y and Z taken together represent an oxygen atom, or, when n=1, X and Z may represent a single bond,
A represents an amino radical selected from the radicals of the formula:

in which R_3 and R_4 are independently selected from hydrogen and alkyl having 1–7 carbon atoms, or R_3 and R_4, together with the nitrogen atom to which they are attached, form a piperidino radical, a piperidino radical substituted with a phenyl group, a piperidino radical substituted with a phenyl group and a cyano group, or a tetrahydropyridyl radical, a tetrahydropyridyl radical

substituted with a phenyl group, the radicals of the formula

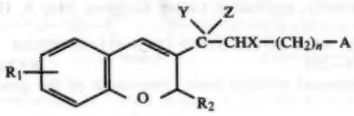


in which p is 2, 3 or 4, R_5 and R_6 are alkyl radicals having 1–7 carbon atoms and R_7 is selected from phenoxy (C_1–C_7 alkyl) and phenylthio (C_1–C_7 alkyl), and the radicals of the formula



in which B is selected from a single bond, alkylene having 1–10 carbon atoms and hydroxyalkylene having 2–3 carbon atoms, and R_8 is selected from hydrogen, phenyl, (C_1–C_7 alkyl) phenyl, (C_1–C_7 alkoxy) phenyl, phenoxy, phenoxy mono-, di- or tri-substituted with alkyl having 1–7 carbon atoms, phenoxy mono-, di- or tri-substituted with alkoxy having 1–7 carbon atoms, phenylthio, pyridyl and chromenyl, and a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition having a bronchodilator activity and an antiarrhythmic activity containing a bronchodilator and antiarrhythmic effective amount of a compound selected from compounds of the general formula:



(I)

in which:

R_1 is selected from hydrogen and alkoxy having 1–7 carbon atoms,

R_2 is hydrogen,

n is selected from zero and 1,

X and Y are hydrogen atoms, and

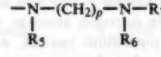
Z is hydroxy, or

Y and Z taken together represent an oxygen atom, or, when n=1, X and Z may represent a single bond,

A represents an amino radical selected from the radicals of the formula:

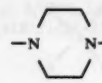
in which R_3 and R_4 are independently selected from hydrogen and alkyl having 1–7 carbon atoms, or R_3 and R_4, together with the nitrogen atom to which they are attached, form a piperidino radical, a piperidino radical substituted with a phenyl group, a piperidino radical substituted with a phenyl group and a cyano group, or a tetrahydropyridyl radical, a tetrahydropyridyl radical substituted with a phenyl group,

the radicals of the formula



in which p is 2, 3 or 4, R_5 and R_6 are alkyl radicals having 1–7 carbon atoms and R_7 is selected from phenoxy (C_1–C_7 alkyl) and phenylthio (C_1–C_7 alkyl), and

the radicals of the formula



in which B is selected from a single bond, alkylene having 1–10 carbon atoms and hydroxyalkylene having 2–3 carbon atoms, and R_8 is selected from hydrogen, phenyl, (C_1–C_7 alkyl) phenyl, (C_1–C_7 alkoxy), phenyl, phenoxy, phenoxy mono-, di- or tri-substituted with alkyl having 1–7 carbon atoms, phenoxy mono-, di- or tri-substituted with alkoxy having 1–7 carbon atoms, phenylthio, pyridyl and chromenyl, and a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable excipient.

4,181,723

3-HYDRAZINO-5,6,7,8,9,10-HEXAHYDRO-CYCLOOCTA[C]PYRIDAZINES

Erhard Schenker, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

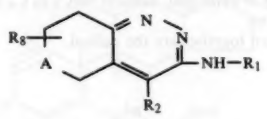
Continuation of Ser. No. 748,743, Dec. 9, 1976, abandoned, which is a continuation of Ser. No. 492,064, Jul. 26, 1974, abandoned. This application Nov. 23, 1977, Ser. No. 854,332

Claims priority, application Switzerland, Aug. 2, 1973, 11217/73; Dec. 21, 1973, 18036/73

Int. Cl.[2] **A61K** *31/50;* **C07D** *237/28, 237/26, 471/04*

U.S. Cl. 424—250 **5 Claims**

1. A compound of formula I,



I

where

R_1 is amino,

R_2 is alkyl of 1 to 4 carbon atoms or phenyl,

R_8 is hydrogen or alkyl of 1 to 4 carbon atoms, and

A is $-(CH_2)_n-$,

wherein n is 3,

or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating hypertension in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,181,724

QUINOXALINONE COMPOUNDS USEFUL FOR EXPANDING THE LUMINA OR AIR PASSAGES IN MAMMALS

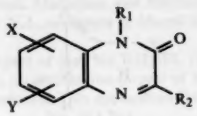
Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 11, 1978, Ser. No. 940,815

Int. Cl.[2] **A61K** *31/495*

U.S. Cl. 424—250 **25 Claims**

1. A method for expanding the lumina or air passages in the lungs of a mammal in need of said treatment which comprises administering to said mammal an effective amount of a compound of the formula



wherein X and Y are the same or different and are hydrogen, fluoro, chloro, bromo, nitro, trifluoromethyl, alkyl of one to four carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, or cyano;

R_1 is hydrogen, methyl or ethyl,

R_2 is hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl, benzyl,

CH_2Z wherein Z is fluoro, chloro or bromo,

CO_2M, CH_2CO_2M, $CH_2CH_2CO_2M$ or CHR_3CO_2M wherein M is hydrogen, alkyl of one to four carbon atoms, inclusive, or a physiologically acceptable metal or amine cation and R_3' is alkyl of one to three carbon atoms, inclusive, with the proviso that M is not hydrogen when R_2 is CH_2CO_2M or CHR_3CO_2M; in association with a pharmaceutical carrier.

4,181,725

METHOD FOR ALLEVIATING PSORIASIS

John J. Voorhees, Ann Arbor, Mich.; Sven R. Hammarström, Djursholm, Sweden; Mats A. Hamberg, Lidingö, Sweden, and Bengt I. Samuelsson, Danderyd, Sweden, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed May 2, 1977, Ser. No. 793,100

Int. Cl.[2] A61K *31/47, 31/355, 31/215, 31/195*

U.S. Cl. 424—258 **12 Claims**

1. A method for alleviating psoriasis which comprises administering to the afflicted human or animal a composition containing as its active component at least one compound selected from the group consisting of para bromophenacyl bromide, alpha tocopherol, mepacrine, chloroquine, hydroxychloroquine, dibucaine, tetracaine, lidocaine, butacaine, procaine, ethylene diamine tetra acetic acid and ethylene glycol bis(β-amino ethyl ether)-N-N' tetra acetic acid, said compound being in association with the pharmaceutical carrier, wherein said active component is present in an amount which is effective to alleviate psoriasis in the range of about 0.1% to about 20% w/v.

4,181,726

METHOD OF ALLEVIATING PRURITIS

Joel E. Bernstein, 615 Brierhill Rd., Deerfield, Ill. 60015

Filed Nov. 16, 1978, Ser. No. 961,239

Int. Cl.[2] A61K *31/485*

U.S. Cl. 424—260 **4 Claims**

1. A method of relieving severe itching in mammalian patients in need of such treatment, said method comprising administering a therapeutically effective amount of naloxone or a pharmaceutically acceptable salt thereof to a patient in need of such treatment.

4,181,727

2,3-DIHYDRO-6,7-DISUBSTITUTED-5-ACYL BENZOFURAN-2-CARBOXYLIC ACIDS

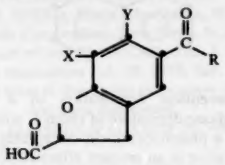
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,087,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1975, abandoned. This application Jan. 27, 1978, Ser. No. 873,022

Int. Cl.[2] A61K *31/425;* **C07D** *275/02*

U.S. Cl. 424—270 **5 Claims**

4. A pharmaceutical composition useful in the treatment of edema associated with hypertension comprising a therapeutically effective amount of a compound of the formula:



wherein

X is chloro;

Y is chloro; and

R is selected from the group consisting of 1,2,5-thiadiazyl or 3-methyl-1,2,5-thiadiazyl and

the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof and a pharmaceutically acceptable carrier.

4,181,728

SPIRO-POLYCYCLICIMIDAZOLIDINEDIONE DERIVATIVES

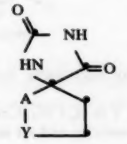
Reinhard Sarges, Mystic, Conn., and John L. Belletire, Madison, Wis., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,335

Int. Cl.[2] C07D *491/10, 495/10, 235/02*

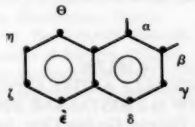
U.S. Cl. 424—273 R **11 Claims**

1. A spiro-polycyclicimidazolidinedione derivative of the formula

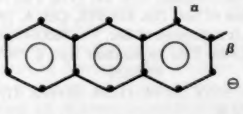


or its pharmaceutically acceptable metallic salt, wherein:

A is naphth-α,β-o of the formula



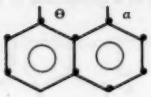
anthracen-α,β-o of the formula

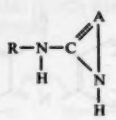


or substituted naphth-α,β-o having 1 or 2 identical substituents selected from methyl, chloro or bromo; and

Y is CH_2, S, SO, SO_2 or O;

or A and Y taken together are a naphth-α,Θ-o ring of the formula





10. A pharmaceutical formulation of a spiro-polycyclicimidazolidinedione derivative of claim 1, which comprises: a combination of a pharmaceutically-acceptable carrier material and the derivative in an amount effective to inhibit harmful, in vivo enzymatic reduction of aldoses or to prevent or alleviate diabetes-associated complications.

11. A method of treating a diabetic host to inhibit harmful, in vivo enzymatic reduction of aldoses or to prevent or alleviate diabetes-associated complications, which comprises: administering to the host an effective amount of a derivative of claim 1.

4,181,729

PHENYL OR PHENOXY SUBSTITUTED SPIRO-IMIDAZOLIDINEDIONE DERIVATIVES

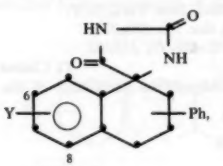
Reinhard Sarges, Mystic, Conn., and John L. Belletire, Madison, Wis., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 21, 1979, Ser. No. 22,400

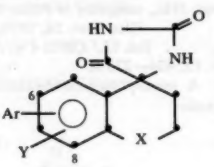
Int. Cl.[2] A61K *31/415;* **C07D** *491/10, 495/10, 235/02*

U.S. Cl. 424—273 R **7 Claims**

1. A phenyl or phenoxy substituted spiroimidazolidinedione derivative selected from the group consisting of



Formula I



Formula II

and the pharmaceutically acceptable metallic salts thereof, wherein:

X is O, S, SO or SO_2; Y is H, CH_3, CH_3O, Ph, PhO, F, Cl or Br at the 6 or 8 position; and Ar is Ph or OPh at the 6 or 8 position.

7. A method of treating a diabetic host to inhibit harmful, in vivo enzymatic reduction of aldoses or to prevent or alleviate diabetes associated complications, which comprises: administering to the host a therapeutic amount of a derivative of claim 1.

4,181,730

PHARMACOLOGICALLY ACTIVE COMPOUNDS AS INHIBITORS OF H-2 HISTAMINE RECEPTORS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 736,662, Oct. 29, 1976, Pat. No. 4,104,381, which is a division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Apr. 6, 1978, Ser. No. 893,859

Int. Cl.[2] A61K *31/44, 31/54, 31/415, 31/425*

U.S. Cl. 424—273 R **5 Claims**

5. A method of inhibiting gastric acid secretion which comprises administering internally to an animal in need of inhibition of gastric acid secretion in an effective amount to inhibit gastric acid secretion a heterocyclic compound of the formula:

wherein A taken together with the nitrogen and carbon atoms shown forms an imidazoline ring said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is an imidazole, ring, said ring being optionally substituted bylower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceuticallly acceptable acid addition salt thereof.

4,181,731

NOVEL THERAPEUTIC APPLICATION OF 4-CARBAMOYL-5-HYDROXYIMIDAZOLE

Noboru Yoshida, Osaka; Takao Kiyohara, Ibaraki, and Shigeo Ogino, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 831,115, Sep. 7, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 918,074

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 R **9 Claims**

1. A method for the treatment of rheumatism and nephritis which comprises administering a composition containing an effective anti-rheumatic or anti-nephritic amount of 4-carbamoyl-5-hydroxyimidazole or a pharmaceutically acceptable salt thereof as an active ingredient and a pharmaceutically acceptable carrier or diluent to a patient suffering from rheumatism or nephritis.

4,181,732

1-BRANCHED-ALKYLCARBONYL-3-(3,5-DIHALO-PHENYL)IMIDAZOLIDINE-2,4-DIONES

Chiyozo Takayama, Sonehigashi; Shigeo Yamamoto, Osaka; Toshiro Kato, Hyogo; Yoshio Hisada, Hyogo; Shuichiro Asao, Hyogo, and Yoshinori Nakayama, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

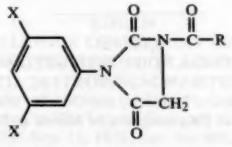
Filed Jul. 20, 1978, Ser. No. 926,396

Claims priority, application Japan, Aug. 2, 1977, 52/93182

Int. Cl.[2] A61K *31/415;* **C07D** *233/80*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula:



wherein X is a chlorine or bromine atom and R is a C_3–C_5 branched alkyl group.

7. A method for controlling fungi which comprises applying a fungicidally effective amount of the compound according to claim 1 to the fungi.

4,181,733
CARBOXYL DERIVATIVES OF THIENAMYCIN

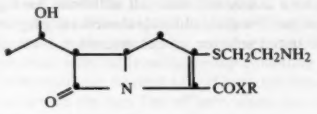
Burton G. Christensen, Metuchen, and Raymond A. Firestone, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 733,651, Oct. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 634,298, Nov. 21, 1975, abandoned. This application Dec. 16, 1977, Ser. No. 861,314

Int. Cl.[2] C07D *487/04;* A61K *31/40*

U.S. Cl. 424—274 5 Claims

1. A compound having the structural formula:



wherein X is oxygen, sulphur or NR' (R'=H or R); R is selected from the group consisting of hydrogen (X is not oxygen); alkyl having 1–10 carbon atoms; phenacyl and nuclear substituted phenacyl wherein the substituent is chloro, bromo, fluoro or alkyl having from 1–6 carbon atoms; alkoxyalkyl wherein the alkoxyl moiety has 1–6 carbon atoms and the alkyl moiety has 1–6 carbon atoms; alkanoyloxyalkyl having 2 to 12 carbon atoms; halo and perhaloalkyl wherein the halo is chloro, bromo, or fluoro and the alkyl chain has 1–6 carbon atoms; alkenyl having from 2–10 carbon atoms; alkoxycarbonyloxyalkyl having 3–14 carbon atoms; dialkylaminoacetoxyalkyl having 4–21 carbon atoms; alkanoylamidoalkyl having 2–13 carbon atoms; benzyl, benzhydryl, p-chlorobenzyl, o-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, m-benzoylbenzyl, p-t-butylbenzyl, m-phenoxybenzyl, p-benzoylbenzyl, p-nitrobenzyl, 3,5-dichloro-4-hydroxybenzyl, p-methoxycarbonylbenzyl, p-methoxybenzhydryl, p-carboxybenzyl, the latter being either the free acid or the sodium salt, 2,4,6-trimethylbenzyl, p-pivaloyloxybenzyl, p-t-butoxycarbonyl benzyl, p-methylbenzyl, p-benzoyloxybenzyl, p-acetoxybenzyl, p-2-ethylhexanoylbenzoyl, p-ethoxycarbonylbenzyl, p-benzoylthiobenzyl, p-benzamidobenzyl, o-pivaloxyloxybenzyl, m-pivaloyloxybenzyl, p-isopropoxybenzyl, p-t-butoxybenzyl, 2,2-dimethyl-5-coumaranmethyl, p-trimethylsilylbenzyl, 3,5-bis-t-butoxy-4-hydroxybenzyl; 2-thienylmethyl, 2-furylmethyl, 3-t-butyl-5-isothiazolmethyl, 6-pivaloyloxy-3-pyridazinylethyl, 5-phenylthio-1-tetrazolylmethyl, phthalidyl; phenylethyl, 2-(p-methylphenyl)ethyl, (4-methoxy)phenozymethyl, phenoxymethyl, (4-chloro)-phenoxymethyl, (4-nitro)phenoxymethyl, (4-benzyloxy)-methyl, (4-methyl)phenoxymethyl, (4-benzyloxy)phenoxymethyl, (4-methyl)phenoxymethyl, (2-methoxy)phenoxymethyl, (1-phenoxy)ethyl, (4-amino)phenoxymethyl, (4-methoxy)phenylthiomethyl, (4-chloro)phenylthiomethyl, phenylthioethyl; (4-methyl)phenyl, (4-hydroxy)phenyl, (4-t-butyl)phenyl; p-nitrophenyl, 3,5-dinitrophenyl or p-carboxyphenyl, the latter having either the free acid or the sodium salt form, 3-phenyl-2-propenyl, benzyloxymethyl, (4-nitro)benzyloxymethyl, (4-chloro)benzyloxymethyl, methylthioethyl, ethylthioethyl, cyclohexylthiomethyl, decylthiobutyl, methylthiopropyl, isopropylthioethyl, methylthiobutyl, phenyl, 5-indanyl, acetylthiomethyl, acetoxymethyl, diethylamino, dimethylaminoethyl, 5-indanylmethyl, p-pivaloylbenzyl, benzyloxymethyl, acetylthioethyl, pivaloylthiomethyl and methylthiomethyl.

4. An antibiotic pharmaceutical composition consisting essentially of a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,181,734
PESTICIDAL N-[2,2-DIMETHYL-2,3-DIHYDRO-7-BENZOFURANYL-METHYL-CARBAMATE]N-[4-NONYLPHENYL-METHYL-CARBAMATE] SULFIDE

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 803,280, Jun. 3, 1977, Pat. No. 4,124,721. This application Jul. 18, 1978, Ser. No. 925,843

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[2] A01N *9/12;* C07D *307/86*

U.S. Cl. 424—285 3 Claims

1. N-[2,2-Dimethyl-2,3-dihydro-7-benzofuranyl methylcarbamate] N-[4-nonylphenylmethylcarbamate] sulfide.

2. An insecticidal, and nematocidal composition comprising an acceptable carrier and as the active toxicant an insecticidally or nematocidally effective amount of a compound according to claim 1.

4,181,735
NEMATOCIDAL CYCLOPROPANE CARBOXYLATES

Serge Smolikowski, Marseille, and Jean J. Herve, Aubagne, both of France, assignors to Roussel UCLAF, Paris, France

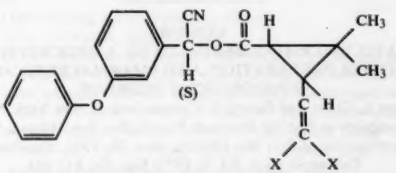
Filed Aug. 30, 1978, Ser. No. 937,990

Claims priority, application France, Sep. 8, 1977, 77 27191

Int. Cl.[2] A01N *9/06, 9/20*

U.S. Cl. 424—304 3 Claims

1. A method of combatting vegetable nematodes comprising contacting the vegetable nematodes with a nematocidally effective amount of at least one compound of the formula



wherein X is selected from the group consisting of chlorine and bromine and the alcohol is the (S) structure and the acid has the cis or trans, racemic or optically active form.

4,181,736
PHENYLACETIC ACID DERIVATIVES AND THERAPEUTIC COMPOSITION CONTAINING SAME

Jacques G. Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Moulineaux, France

Continuation of Ser. No. 749,479, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 285,127, Aug. 31, 1972, Pat. No. 4,031,133. This application Nov. 21, 1978, Ser. No. 962,653

Claims priority, application United Kingdom, Sep. 4, 1971, 41327/71

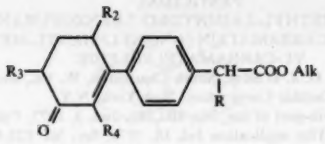
Int. Cl.[2] A61K *31/19;* C07C *65/20, 69/95*

U.S. Cl. 424—317 6 Claims

1. A compound selected from the group consisting of 4(3-oxo-1-cyclohexenyl) phenyl acetic acid, 2[4(3-oxo-1-cyclohexenyl) phenyl] propionic acid and the pharmaceutically acceptable salts thereof.

4. Pharmaceutical compositions having analgesic and anti-inflammatory activity comprising an analgesic and anti-inflammatory effective amount of a compound selected from the group consisting of 4(3-oxo-1-cyclohexenyl) phenyl acetic acid, 2[4(3-oxo-1-cyclohexenyl) phenyl] propionic acid and the pharmaceutically acceptable salts thereof together with a pharmaceutically acceptable carrier.

6. Compounds of the formula:



(IV)

in which R, R_2, R_3 and R_4 are selected from the group consisting of hydrogen and the alkyl groups; and their pharmaceutically acceptable salts; the number of carbon atoms in alkyl groups R and R_3 being from 1 to 4, and in R_2 and R_4 being from 1 to 8; Alk being lower alkyl.

4,181,737

4-((3-METHOXYPHENYL)AMINO)BENZOIC ACID, A METHOD FOR TREATING HYPERLIPIDEMIA, AND COMPOSITIONS THEREOF

Eugene R. Wagner, Carmel, and Alfred A. Renzi, Zionsville, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1978, Ser. No. 907,078
Int. Cl.[2] A61K *31/19;* **C07C** *101/60*
U.S. Cl. 424—319 **3 Claims**

1. The compound 4-((3-methoxyphenylmethyl)amino)benzoic acid and the pharmaceutically-acceptable salts thereof.

2. A method for treating hypocholesterolemia in a mammal which comprises administering internally to the mammal an effective hypocholesterolemic amount of the compound 4-((3-methoxyphenylmethyl)amino)benzoic acid or a pharmaceutically-acceptable salt thereof.

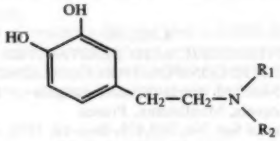
4,181,738

CATECHOLAMINE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

James Z. Ginos, and George C. Cotzias, both of New York, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 746,026, Nov. 30, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,854
Int. Cl.[2] A01N *9/24;* **A61K** *31/135;* **C07C** *91/32*
U.S. Cl. 424—330 **32 Claims**

1. A compound of the formula



wherein

R_1 signifies an alkyl group containing 4 to 20 carbon atoms, an unsubstituted or lower alkyl substituted cycloalkylalkyl group, containing 4 to 20 carbon atoms, an unsubstituted or lower alkyl substituted cycloalkyl group containing 3 to 20 carbon atoms, and

R_2 signifies an alkyl group containing 1 to 20 carbon atoms, an unsubstituted or lower alkyl substituted cycloalkylalkyl group containing 4 to 20 carbon atoms, an unsubstituted or lower alkyl substituted cycloalkyl group containing 3 to 20 carbon atoms, and

the pharmaceutically acceptable salts thereof.

21. A method of treatment of physical or physiological and behavioural health disorders, which are caused by or connected with disturbances of the dopamine household in mammals comprising the step of administering to a mammal 0.1 to 500 mg/kg of a compound as defined by claim 1.

4,181,739

METHOD OF PROCESSING LOOSE HERRING ROE

Yoshiji Santo, Machida, Japan, assignor to Nippon Suisan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1978, Ser. No. 898,854
Claims priority, application Japan, Jan. 17, 1978, 52-3525
Int. Cl.[2] A23C *19/00*
U.S. Cl. 426—272 **7 Claims**

1. A method of processing the loose roe of the Atlantic herring which comprises placing the loose herring roe in a first container, soaking the roe in an initial sodium chloride salt solution, removing the mass of the roe from the first container, soaking the roe in two to four additional salt solutions and forming by cohesion the roe into a product of a shape corresponding to a container, said salt solutions having different concentrations of sodium chloride therein ranging from at least 2% in the initial solution to the saturation level in the final solution.

4,181,740

INDOLYL ACETIC ACID DERIVATIVE

Silvia Tricerri Zumin, Carimate, and Alberto Bianchetti, Milan, both of Italy, assignors to Pierrel S.p.A., Italy

Filed May 13, 1977, Ser. No. 796,607
Claims priority, application United Kingdom, May 19, 1976, 20596/76
Int. Cl.[2] A61K *31/405;* **C07D** *209/04*
U.S. Cl. 424—274 **9 Claims**

1. The compound 1-(p-azidobenzoyl)-5-methoxy-2-methyl-3-indolylacetic acid or pharmaceutically acceptable salts or C_1-C_4 lower alkyl esters thereof.

2. A therapeutic composition comprising the compound of claim 1, or a salt or ester thereof, as an active ingredient, together with a pharmaceutically acceptable carrier.

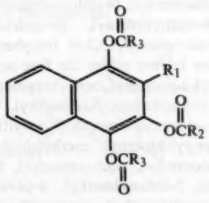
4,181,741

NAPHTHALENE MITICIDES

Greg A. Bullock, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 18, 1977, Ser. No. 852,762
Int. Cl.[2] A01N *9/24;* **C07C** *69/02, 69/18, 69/96*
U.S. Cl. 424—311 **5 Claims**

1. A method for protecting plants from mites comprising applying to the plant locus to be protected an effective amount of a compound of the formula:



wherein

R_1 is straight chain alkyl of 11–14 carbon atoms; and

R_2 and R_3 are independently alkyl of 1–6 carbon atoms o
alkoxy of 1–4 carbon atoms.

4,181,742

METHOD OF PREVENTING GUSHING OF PACKAGED BEER

Goh Horiuchi; Seizo Yabuuchi, both of Yokohama; Satoru Suzuki, Suita, and Mikio Amaha, Tokyo, all of Japan, assignors to Asahi Breweries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 815,912, Jul. 15, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 915,922
Claims priority, application Japan, Apr. 13, 1977, 52/42169
Int. Cl.[2] C12H *1/14;* C12B *1/18*
U.S. Cl. 426—12 7 Claims

1. The process of chill-proofing beer and rendering the beer free from a tendency to foam excessively when a retail sales container filled with the beer is opened after the filled container has been stored for an extended period of time, which consists essentially of the steps of: adding to the beer, prior to placing the beer in the retail sales container, a chill-proofing cysteine protease selected from the group consisting of papain, ficin and bromelain, the amount of said cysteine protease being effective to render the beer free of haze when cooled at 0° C., said cysteine protease also being effective to cause the beer to contain substances which cause excessive foaming of the beer when the retail sales container for the beer is opened after extended storage; and adding to the beer, prior to placing the beer in the retail sales container, an isolated acid protease of microbial orginhaving the properties that (1) its activity is inhibited by the pepsin inhibitor S-PI having the formula (acetyl-valyl)-(valyl)-(4-amino-3-hydroxy-6-methyl heptanoic acid)-(alanyl)-(4-amino-3-hydroxy-6-methyl-heptanoic acid) which is produced by *Streptomyces naniwaensis* and (2) it is ineffective as a chill-proofing agent, the amount of said acid protease being effective to decompose said substances whereby to suppress excessive foaming of the beer when the retail sales container for the beer is opened after extended storage.

4,181,743

FOOD FLAVORINGS AND METHODS FOR PRODUCING SAME

George C. Brumlick, 155 Upper Mountain Ave., Montclair, N.J. 07042, and Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Sep. 15, 1976, Ser. No. 723,512
Int. Cl.[2] A23L *1/221, 1/222*
U.S. Cl. 426—241 20 Claims

1. A low sodium food flavoring produced by the process comprising extracting plant juice from plants, condensing said extracted juice, and toasting said condensate with radiation of an intensity and for a period of time effective to alter the original flavor of the starting plant material.

4,181,744

METHOD OF BROWNING FOODS IN A MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Minneapolis, Minn.

Filed Aug. 30, 1977, Ser. No. 829,074
Int. Cl.[2] A23L *1/00;* H05B *9/06*
U.S. Cl. 426—233 9 Claims

1. A method for imparting a browned appearance to the surface of food in a microwave oven having air circulation wherein said food is placed in a microwave oven and subjected to microwave energy to cook said food, the method comprising the steps of:

(a) positioning a humidity sensor to measure the humidity in the microwave oven, said sensor providing a signal indicative of said humidity to a programmable controller;

(b) comparing said measured humidity with a predetermined humidity value selected for the food being browned and stored in said programmable controller;

(c) adjusting the humidity in said oven toward said predetermined humidity value to provide optimum humidity conditions for surface browning of the food;

(d) repeating steps (a) to (c) on a continuing basis as the food is cooked.

4,181,745

METHOD FOR DECORATING THE SHELLS OF EGGS

Glen H. Growe, 2101 Kenwood Pkwy., Minneapolis, Minn. 55405; Michael P. Patterson, 1425 Maricopa Dr., Oshkosh, Wis. 54901, and David C. Egberg, 1271 Robin La., New Brighton, Minn. 55112

Filed Jan. 3, 1978, Ser. No. 866,356
Int. Cl.[2] A23L *1/27, 1/32*
U.S. Cl. 426—250 13 Claims

1. The method for dyeing the shells of eggs, comprising:

a. preparing a dyeing medium in a dry, granular form, said medium comprising salt and a dyeing agent;

b. wetting at least selected portions of the shell with a hydration agent, selected from the group consisting of water and vinegar in proportions sufficient to activate the dyeing agent; and,

c. applying said dyeing medium to the wetted areas of the shell.

4,181,746

PROCESS FOR PREPARING STEAM-KNEADED VERMICELLI PRODUCTS

Seon H. Shin, Mitatsunamachi Mansion No 1903, 2-3-34 Mita, Minatoku, Tokyo, Japan

Filed Sep. 22, 1977, Ser. No. 835,770
Claims priority, application Japan, Oct. 30, 1976, 51-130712
Int. Cl.[2] A23L *1/16*
U.S. Cl. 426—335 9 Claims

1. A process for preparing vermicelli products which comprises:

(a) introducing into a kneading vessel

(1) a vermicelli material, and

(2) 35–40 parts of water per 100 parts of vermicelli material, said water being at a temperature of 36°–60° C.,

(b) introducing into the kneading vessel compressed steam under a pressure of 0.6–2.5 Kg/cm^2, and thereby causing steam kneading of the contents, said steam being introduced into the kneading vessel at the same time as said water or just after the water is added,

(c) elevating the temperature of the vermicelli material in the kneading vessel to 50° C. within a period of 15 to 60 seconds with the introduced steam,

(d) continuing the steam-kneading in the kneading vessel until the temperature of the vermicelli material is elevated to the range of 90°–100° C., and

(e) recovering a semi-transparent, yellowish white vermicelli paste high in viscoelaesticity.

4,181,747

PROCESSED VEGETABLE SEED FIBER FOR FOOD PRODUCTS

Hunter L. Kickle, Mt. Zion; William J. Ball, Jr., and Robert Von Schanefelt, both of Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 849,289, Nov. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,246
Int. Cl.[2] A23L *1/27*
U.S. Cl. 426—615 18 Claims

1. In a method of making pasteurized food fiber from crude fiber-containing vegetable seed hulls, the steps comprising:

(a) mixing water and said vegetable hulls to form an aqueous slurry;

(b) maintaining the pH of said aqueous slurry in the range of 2.5–5.0;

(c) heating said slurry to a temperature of about 155° F.–180° F. for 15–60 minutes to acid-pasteurize said seed hulls;

(d) dewatering said aqueous slurry of seed hulls;

(e) washing said dewatered seed hulls with fresh water to further refine said seed hulls;

(f) dewatering the washed seed hulls; and
(g) drying said dewatered seed hulls to obtain refined, acid-pasteurized vegetable fiber suitable for human consumption.

4,181,748

COMBINED DRY-WET MILLING PROCESS FOR REFINING CORN

Vincent P. Chwalek, Los Angeles, Calif., and Richard M. Olson, North Riverside, Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 11, 1978, Ser. No. 904,838
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—623 **16 Claims**

1. A continuous corn refining process, which comprises:
(A) dry milling whole grain corn to provide
(a) an endosperm fraction,
(b) a germ fraction,
(c) a fiber (hull) fraction, and
(d) a cleanings fraction;
(B) wet milling the endosperm fraction of (A)(a) by sequentially
(i) steeping the endosperm fraction,
(ii) separating the larger wet endosperm particles from the smaller wet endosperm particles,
(iii) milling the larger wet endosperm particles to reduce their particle size,
(iv) recombining the wet endosperm particles of (ii) and (iii) into a single fraction, and
(v) steeping the endosperm fraction again to provide a mill starch slurry;
(C) separating fine fiber tailings from the mill starch slurry of (B)(v);
(D) separating the defibered mill starch slurry of (C) into a starch-rich fraction and a protein-rich fraction;
(E) concentrating the protein-rich fraction of (D);
(F) directly combining each of the fiber (hull) fraction and the cleanings fractions of (A), the fine fiber tailings fraction of (C) and the protein-rich concentrate of (E) without removing any corn oil therefrom, with the germ fraction of (A) to provide a wet animal feed product; and
(G) drying the wet feed product of (F) to obtain a final animal feed product.

4,181,749

PROCESS FOR PRODUCING SURIMI

Hiroshi Niki, Ebetsu; Tuneo Katou, Sapporo; Eiki Deya, Sapporo; Toru Doi, Sapporo; Kenkichi Ahiko, Kodaira, and Hiromichi Hayashi, Sapporo, all of Japan, assignors to Snow Band Milk Products Co., Ltd., Sapporo, Japan

Filed Feb. 21, 1978, Ser. No. 879,500
Claims priority, application Japan, Aug. 19, 1977, 52/99986
Int. Cl.[2] A22C *25/00*
U.S. Cl. 426—643 **3 Claims**

1. A process for producing surimi suitable for the production of fish meat jelly products which comprises the steps of:
(a) mincing fresh raw fish meat to convert the myofibrils present therein into a sol;
(b) washing the sol with a sufficient amount of water to remove water soluble proteins;
(c) dewatering the sol after washing;
(d) mixing the dewatered sol with a sufficient amount of a salt solution to solubilize salt-soluble proteins;
(e) diluting the mixture from (d) with a sufficient amount of water to form a precipitate;
(f) dewatering the precipitate to recover the precipitate;
(g) heating water effluent from step b) to coagulate water-soluble proteins contained therein; and
(h) compounding the obtained protein coagulate with the recovered precipitate to obtain the surimi.

4,181,750

METHOD OF DEPOSITING A METAL ON A SURFACE

William M. Beckenbaugh, East Amwell Township, Hunterdon County; Patricia J. Goldman, Ewing Township, Mercer County, and Kim L. Morton, Delaware Township, Hunterdon County, all of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,824
Int. Cl.[2] B05D *3/06*; G03D *5/00*
U.S. Cl. 430—414 **24 Claims**

1. A method for selectively depositing a metal on a surface, which comprises:
(a) coating the surface with a sensitizing solution comprising at least a reducible salt of a non-noble metal to form a sensitized surface;
(b) selectively treating a portion of said sensitized surface to form a catalytic real image; and
(c) exposing said real image containing surface to a stripper comprising an organic acid selected from the group consisting of (a') a monocarboxylic acid having a structural formula of

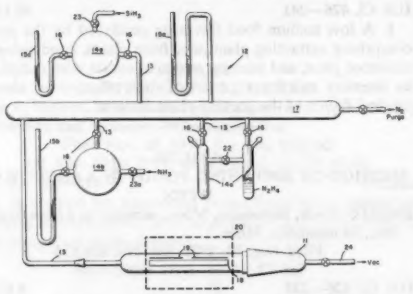
where R is a member selected from the group consisting of H and an alkyl group having 1 to 3 carbon atoms, (b') citric acid and (c') a mixture of (a') and (b'), to essentially selectively remove untreated portions of said sensitized surface.

4,181,751

PROCESS FOR THE PREPARATION OF LOW TEMPERATURE SILICON NITRIDE FILMS BY PHOTOCHEMICAL VAPOR DEPOSITION

Thomas C. Hall, Irvine, and John W. Peters, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 24, 1978, Ser. No. 910,704
Int. Cl.[2] C01B *21/06*; B05D *3/06*
U.S. Cl. 427—53.1 **7 Claims**



1. A process for depositing silicon nitride (Si_3N_4) films comprising:
a. forming a vapor mixture of oxygen and moisture-free ammonia, silane and hydrazine in predetermined controlled amounts,
b. sensitizing said mixture to change the level at which molecules therein absorb photon energy by saturating said mixture with mercury vapors,
c. introducing a predetermined photon energy into said mixture and in quantity sufficient to excite molecules therein to a reactive state and produce a photochemical reaction which yields Si_3N_4 vapors, and
d. passing said Si_3N_4 vapors over a chosen substrate heated

to a preselected elevated temperature to deposit high quality Si_3N_4 films thereon which are substantially free of pinholes.

4,181,752

ACRYLIC-TYPE PRESSURE SENSITIVE ADHESIVES BY MEANS OF ULTRAVIOLET RADIATION CURING

John A. Martens, White Bear Lake; Lawrence M. Clemens, Minneapolis, and Alvin R. Zigman, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 680,056, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 502,426, Sep. 3, 1974, abandoned. This application Sep. 25, 1978, Ser. No. 945,406

Int. Cl.² C08F *2/46, 4/00*

U.S. Cl. 427—54.1 **12 Claims**

1. A process for the preparation of a normally tacky pressure-sensitive adhesive comprising subjecting a suitable mass of a radiation-sensitized solventless liquid mixture containing as a major proportion thereof at least one acrylic acid ester of an alkyl alcohol, said alcohol containing from 4 to 14 carbon atoms, and at least one monomer copolymerizable therewith to radiation in the near ultraviolet region at a rate or irradiation in the 3000–4000 A wavelength range of not more than 7 milliwatts per square centimeter of the mass exposed, said radiation allowably also containing incidental radiation energy, the amount of said incidental radiation energy having wavelengths shorter than 3000 A being limited to not more than about 10% of the amount of energy in the 3000–4000 A range.

4,181,753

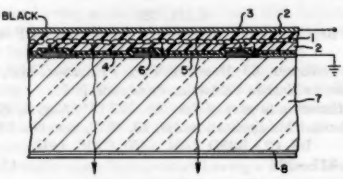
PROCESS FOR THE PRODUCTION OF ELECTROLUMINESCENT POWDERS FOR DISPLAY PANELS AND COATING THE POWDERS WITH ZINC PHOSPHATE

Albert G. Fischer, Dortmund, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 715,715, Aug. 19, 1976, Pat. No. 4,143,297. This application May 17, 1978, Ser. No. 906,887

Int. Cl.² B05D *5/06*

U.S. Cl. 427—64 **2 Claims**



2. In a process for producing electroluminescent powder for display devices having a monoparticle layer of electroluminescent powder embedded in a high dielectric constant resin between two electrodes, the steps of doping zinc sulfide powder with at least one halogen compound of a metal selected from the group consisting of aluminum, copper and magnesium dissolved in an organic solvent, heating the doped powder at a temperature from about 800° C. to about 1050° C. in a hydrogen sulfide gas stream which is initially very slow moving and later faster moving to drive off halogen vapors, thereafter heating the powder to about 350° C. to 550° C. in molten sulfur and adding thereto a small amount of at least one of the sulfides of copper, arsenic and antimony, freeing the powder from sulfur, and thereafter coating the zinc sulfide particles coactivated with aluminum in said powder by boiling said powder in phosphoric acid to produce a zinc phosphate surface coating.

4,181,754

IN SITU METHOD OF PREPARING MODIFIED TITANIUM DIOXIDE PHOTOACTIVE ELECTRODES

Howard McKinzie, Framingham, and Elizabeth A. Trickett, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 22, 1978, Ser. No. 918,002

Int. Cl.² C25B *11/04, 11/10*

U.S. Cl. 427—74 **5 Claims**

1. A method of preparing polycrystalline thin film photoactive semiconductor electrodes utilizable in photoassisted oxidation reactions comprising sequentially the steps of:

providing a suspension of finely divided modifying oxide in a volatile solvent wherein the modifying oxide comprises at least one oxide of a metal selected from the group consisting of the d-electron transition metals excluding titanium, the metal exhibiting an oxidation state other than +4 in the oxide,

applying the suspension of modifying oxide to the surface of a titanium metal body to form a thin film of the modifying oxide thereon, and

heating the coated titanium metal body in an oxygen-containing atmosphere at an elevated temperature below about 800° C., for a period of time sufficient to form an adherent layer of titanium dioxide on the surface of the titanium body, whereby the titanium dioxide contains the modifying oxide in a uniform concentration gradient having a minimum at the titanium body surface and a maximum at the surface of said layer of titanium dioxide.

4,181,755

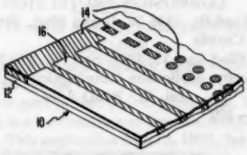
THIN FILM PATTERN GENERATION BY AN INVERSE SELF-LIFTING TECHNIQUE

Shing-Gong Liu, Princeton, and Ferdinand C. Duigon, East Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 21, 1978, Ser. No. 962,719

Int. Cl.² B05D *5/12;* **H01L** *29/48, 31/18*

U.S. Cl. 430—314 **10 Claims**



1. A method of generating a predetermined pattern of electrically conductive circuit film and an intimately adjacent dielectric barrier film on a substrate, comprising the steps of:

(a) applying a layer of circuit film material on a surface of the substrate;

(b) generating a photoresist pattern on the circuit film material, the photoresist being coincident with the predetermined circuit film pattern;

(c) removing those portions of the circuit film material which are not covered with photoresist, to form the circuit film pattern on the surface of the substrate;

(d) depositing a continuous layer of barrier film on the surface of the substrate and the circuit film pattern such that the barrier film is in intimate contact with that portion of the circuit film not covered by photoresist; and

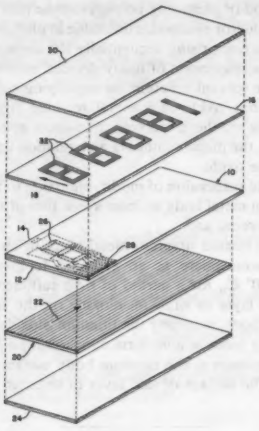
(e) removing the photoresist remaining on the circuit film pattern so that the barrier film covering the photoresist lifts off, thereby exposing the circuit film pattern.

4,181,756

PROCESS FOR INCREASING DISPLAY BRIGHTNESS OF LIQUID CRYSTAL DISPLAYS BY BLEACHING POLARIZERS USING SCREEN-PRINTING TECHNIQUES

James L. Fergason, 5806 Horning Rd., Kent, Ohio 44240

Filed Oct. 5, 1977, Ser. No. 839,672
Int. Cl.[2] G02F *1/13*
U.S. Cl. 427—163 **6 Claims**



1. A method for selectively bleaching sections of a planar polarizer comprising silk-screening onto selected areas of the polarizer a gel containing a substance which will bleach the polarizer dye, the gel having a consistency making it silk-screenable to form an accurate pattern with clearly-defined edges, and removing the gel after the dye has been bleached.

4,181,757

PROCESS FOR SURFACE COATING GOLD ALLOYS ONTO A METALLIC SUBSTRATE TO ENHANCE CORROSION PROTECTION

William V. Youdelis, 1935 W. Grand Blvd., Windsor, Ontario, N9E 1G6, Canada

Filed Jan. 17, 1978, Ser. No. 870,232
Claims priority, application Canada, Oct. 27, 1977, 289645
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—229 **11 Claims**

1. A process to provide an improved surface corrosion resistance and surface hardness to a substrate composed of a metal less noble than gold, which process comprises:

(a) surface coating the less noble metal substrate with a slurry composed of (i) a gold alloy powder, said gold alloy having a melting point less than 600° C., (ii) an essentially inorganic oxide-dissolving flux which becomes fully active in a temperature range of about 550° C. to 600° C. and (iii) an organic liquid;

(b) firing the slurry coating to a temperature of about 540° C. and above to melt and spread the gold alloy over the surface of the less noble underlying metal substrate.

4,181,758

METHOD FOR PREVENTING THE DEPOSITION OF A COATING ON A SUBSTRATE

Richard C. Elam, Manchester, Conn., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Division of Ser. No. 710,060, Jul. 30, 1976, Pat. No. 4,128,522.
This application Feb. 6, 1978, Ser. No. 875,472
Int. Cl.[2] B05D *1/32; C23C 9/02*
U.S. Cl. 427—253 **10 Claims**

1. A method for preventing the deposition of an aluminum-based pack coating on a pre-determined portion of a substrate, said method comprising the steps of:

preparing a maskant composition having:

a solids portion including:

a reducable material in an amount in excess of about 8% by weight of said solids portion and being capable or reacting with and being reduced by said coating, said reduceable material being selected from the group consisting of zirconium oxide, ferric oxide, titanium dioxide, titanium sesquioxide and nickelous oxide; and

an inhibitor in an amount sufficient to control the rate of reaction between the reduceable material and the coating, thereby preventing excessive volumetric change of the maskant, said inhibitor being selected from the group consisting of tungsten, molybdenum, tantalum, cobalt, chromium, iron and nickel and wherein said amount comprises an amount up to about 92% by weight of said solids portion; and

a binder vehicle, including a resinous material and a solvent in which the solids portion is suspended;

applying said maskant composition to the pre-determined portion of said substrate and allowing said maskant composition to dry;

applying said pack coating to said substrate; and

removing said maskant composition from said substrate.

4,181,759

PROCESS FOR METAL DEPOSITION OF A NON-CONDUCTOR SUBSTRATE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540, assignor to Nathan Feldstein, Princeton, N.J.

Continuation-in-part of Ser. No. 712,131, Aug. 5, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,242
Int. Cl.[2] B05D *3/04, 3/10; C23C 3/02*
U.S. Cl. 427—304 **17 Claims**

1. A process for the catalytic preparation of non-conductor substrate prior to electroless metal deposition comprised of the step of contacting said substrate with a catalytic colloidal composition prepared by

(a) admixing

1. stannous ions in a molar concentration excess to precious metal ions and in a molar concentration excess to readily hydrolyzable stannic ions, with

2. precious metal ions, and

3. a readily hydrolyzable stannic compound which upon heating results in the conversion of the stannic ions to colloidal aged tin(IV) which imparts a colloidal nature to said composition and further wherein the readily hydrolyzable stannic compound is derived from an extraneous source, and

4. an acid, and

(b) exposing said admixture to thermal energy whereby converting the stannic ions in said readily hydrolyzable stannic compound to said colloidal aged tin(IV).

4,181,760

METHOD FOR RENDERING NON-PLATABLE SURFACES PLATABLE

Nathan Feldstein, Princeton, N.J., assignor to Surface Technology, Inc., Princeton, N.J.

Filed Jun. 6, 1977, Ser. No. 803,777

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] C23C *3/02;* B05D *3/10*

U.S. Cl. 427—305 **17 Claims**

9. A process for metallizing a non-catalytic to conventional electroless plating metal or alloy by conventional electroless plating comprising the steps of:

(a) contacting said non-catalytic metal or alloy with a promotor composition wherein said promoter composition comprises a suitable reducing agent and metal ions and wherein said reducing agent is capable of chemically reacting with said non-catalytic metal or alloy and the metal ions within the promoter composition and wherein said metal ions are selected from the group consisting of nickel, cobalt, and iron and mixtures thereof, and wherein the relative molar concentration of the reducing agent to the metal ions is sufficient to permit the initial chemical interaction of the reducing agent with the non-catalytic metal or alloy and then the heterogeneous reduction of the metal ions present in the promoter composition, then

(b) contacting the treated non-catalytic metal or alloy with a conventional electroless plating bath and wherein said electroless plating bath comprises hypophosphite.

4,181,761

SHAPED ARTICLES OF ETHYLENE-VINYL ACETATE COPOLYMER HAVING A COATING OF NCO-FREE RADICAL-CONTAINING SYNTHETIC RESIN PAINT

Ryoji Ishimoto; Katsuhiko Hasuo, both of Ichihara; Masanori Hisatomi, Kisarazu; Kensaku Yamawaki, Ichihara; Sadao Masuda, Chiba, and Seiichi Tada, Ichihara, all of Japan, assignors to Mitsui Polychemicals Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,713

Claims priority, application Japan, Dec. 12, 1977, 52-148197

Int. Cl.[2] B60R *13/00, 13/02*

U.S. Cl. 428—31 **5 Claims**

1. A shape article comprising a substrate substantially of an ethylene-vinyl acetate copolymer and formed on its surface, (C) a coating having an elongation of at least 10% formed from a synthetic resin paint containing an NCO-free radical; said substrate being either

(A) a shaped article of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 3 to about 35% by weight, said shaped article having a coating on its surface formed from a solution of a resin selected from the group consisting of

(a_1) a partially saponified product having a degree of saponification of up to about 50% of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 12 to about 45% by weight,

(a_2) a graft copolymer of said partially saponified ethylene-vinyl acetate copolymer (a_1) and a carboxyl-containing monomer grafted thereto,

(a_3) a graft copolymer of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 12 to about 45% by weight and grafted thereto, at least one monomer having a radical selected from the group consisting hydroxyl, carboxyl, acid anhydride, alkoxy and glycidyl radicals, and

(a_4) a copolymer of ethylene, an unsaturated ester and at least one monomer having a radical selected from the group consisting of hydroxyl, carboxyl, alkoxy and glycidyl radicals, said copolymer having an ethylene content of about 55 to about 88% by weight,

(B) a shaped article of a blend of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 3 to about 35% by weight with a resin selected from the group consisting of

(b_1) about 5 to about 30 parts by weight, based on the blend, of a saponification product of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 5 to about 90% by weight,

(b_2) about 5 to about 30% by weight, based on the weight of the blend, of a copolymer of ethylene and at least one monomer having a radical selected from the group consisting of hydroxyl, carboxyl, alkoxy and glycidyl radicals, said copolymer having an ethylene content of about 70 to about 98%,

(b_3) about 2 to about 30% by weight, based on the blend, of a copolymer of ethylene, an unsaturated ester and at least one monomer having a radical selected from the group consisting of hydroxyl, carboxyl, alkoxy and glycidyl radicals, said copolymer having an ethylene content of about 55 to about 98% by weight, and

(b_4) about 0.5 to about 30% by weight, based on the blend, of a graft copolymer of a polymer of an α-olefin or a copolymer of an α-olefin with up to 45% by weight of another copolymerizable monomer, and grafted thereto, at least one monomer having a radical selected from the group consisting of hydroxyl, carboxyl, acid anhydride, alkoxy and glycidyl radicals,

(B') a shaped article of graft copolymer of an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 3 to about 35% by weight, and grafted thereto, at least one monomer having a radical selected from the group consisting of hydroxyl, carboxyl, acid anhydride, alkoxy and glycidyl radicals, or

(B'') a shaped article resulting from the saponification of the surface of a shaped article of an ethylene-vinyl acetate copolymer having a vinyl acetate content of 3 to 35% by weight.

4,181,762

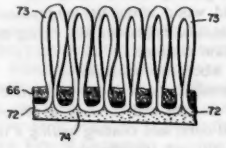
FIBERS, YARNS AND FABRICS OF LOW MODULUS POLYMER

Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 871,091, Jan. 19, 1978, abandoned, which is a continuation of Ser. No. 665,632, Mar. 10, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,465

Int. Cl.[2] D02G *3/00;* D04H *11/00*

U.S. Cl. 428—97 **63 Claims**



34. A pile fabric comprising a backing and yarns secured to the backing and extending outwardly therefrom, the yarns comprising a strand of multiple monofilament fibers of polymeric material, said polymeric material characterized by an elastic modulus of from 5,000 to 60,000 psi, an area moment of inertia of from 400×10^{-14} to $7{,}000\times10^{-14}$ in^4, and a stiffness parameter of from 1×10^{-5} to 1×10^{-8} $lb\text{-}in^2$.

4,181,763

PROCESS FOR PRODUCING SIMULATED WOODEN ARTICLES

Robert L. Shellenberger, 4711 Wunder Ave., Trevose, Pa. 19047

Continuation-in-part of Ser. No. 650,507, Jan. 19, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,492

Int. Cl.[2] B32B *3/10, 3/26*

U.S. Cl. 428—142 **10 Claims**

1. A process for producing simulated antique wooden articles consisting essentially of the application of flame articles consisting essentially of the application of flame from a cutting torch to different portions of the surface of wooden articles at least 0.5-inch thick to provide articles having holes, grooves, cracks, slots, recesses or a combination of these design elements, wherein said design elements are cut across the grain of the wood surface; wherein said flame is provided by the burning of a mixture of a fuel gas and a combustion supporting gas and wherein through said torch is provided a substantially continuous stream of gas jet impinging on said surface, said gas jet also providing simultaneous removal of char from the design elements.

4,181,764

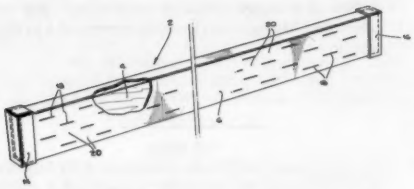
WEATHER RESISTANT STRUCTURE AND METHOD OF MAKING

Clyde D. Totten, 31557 1/2 Castaic Rd., Castaic, Calif. 91310

Filed Aug. 31, 1977, Ser. No. 829,287

Int. Cl.[2] B32B *21/04;* **D06N** *7/04*

U.S. Cl. 428—155 **8 Claims**



1. A rail comprising:

an elongated wooden core;

a weather and abrasion resistant protective plastic coating having a thickness of at least about 0.020 inch; and

a plurality of valve means for releasing vapor from said core through said coating and substantially preventing the passage of water through said coating toward said core, said valve means opening responsive to pressure from the core side of said coating.

8. The method of manufacture of a rail having a protective coating sheath therearound comprising the steps of:

selecting an elongated piece of wood; and

introducing said wood along its longitudinal axis into a crosshead die, said crosshead die being mounted on a plastic extrusion machine;

subjecting said wood to a vacuum;

extruding a thermoplastic resin on said wood while maintaining said vacuum and forming a protective coating enclosing said core, said coating having a thickness of at least about 0.020 inch thereon; and

allowing said coating to cool, said method including the step of forming a plurality of spaced perforations through said coating without removing any of the coating material, said perforations defining valve means for releasing vapor from said wood through said coating and substantially preventing the passage of water through said coating toward said wood, said valve means being openable responsive to pressure from the core side of said coating.

4,181,765

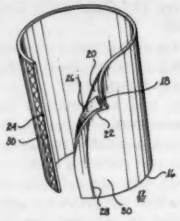
INSULATOR FOR CANNED DRINKS

Richard C. Harmony, 3426 N. Forgeus Ave., Tucson, Ariz. 85716

Filed Sep. 27, 1978, Ser. No. 946,362

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—157 **17 Claims**



14. A removable reusable thermal insulator for containers, said insulator comprising in combination:

(a) a sheet of polyethylene foam for contactingly circumscribingly engaging the container, said sheet having opposed ends, said sheet being sized in width and length to circumscribe the container with at least partial overlap of said opposed ends; and

(b) adhesive means disposed upon a surface of one of said opposed ends for non-permanently adhering said one opposed end to the other of said opposed ends upon circumscribing mounting of said insulator about the container, said adhesive means comprising a length of tape having a first side and a second side, first adhesive means disposed upon said first side for adhering said tape to said one opposed end and second adhesive means disposed upon said second side for adhering said tape to said other opposed end;

whereby, said insulator is removably mountable in contacting relationship about the container to insulate thermally the contacted container surface.

4,181,766

LAMINATES COMPRISING WEATHERABLE COATINGS AND PRIMER COMPOSITIONS COMPRISING A MIXTURE OF AN ACRYLIC POLYMER AND A CELLULOSIC ESTER

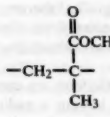
Brian H. Williams, White Bear Lake, and J. Lamar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 1, 1978, Ser. No. 938,867

Int. Cl.[2] B32B *7/02;* **G02B** *5/128;* **B32B** *5/16, 27/30*

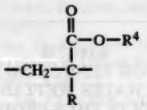
U.S. Cl. 428—216 **18 Claims**

1. A multi-layered article comprising an acrylic substrate comprising at least 70% by weight of units having the formula:



having coated on one surface thereof a composition comprising:

(a) 10 to 85 percent by weight of an acrylic polymer comprising repeating units of the formula



wherein R is H or CH_3 and R^4 is an alkyl group of 1 to 4 carbon atoms, said polymer having no more than 50% by weight of said repeating units having R^4 groups of more than 2 carbon atoms,

(b) 15 to 90 percent by weight of cellulose esters of carboxylic acids, said esters having 0.5 to 5.5 percent by weight of unesterified hydroxyl groups, a viscosity at 25° C. of 300 to 10,000 centipoise, and an acyl content of no more than 56 percent by weight derived from carboxylic acids having 2 to 4 carbon atoms and no more than 20 percent by weight of said acyl content being derived from carboxylic acids having fewer than 3 carbon atoms, and

(c) 0 to 65 percent by weight of an aliphatic epoxy compound,

and coated over said composition an abrasion resistant coating comprising the cured product of an epoxy-terminated silane.

10. The article of claim 1 wherein said acrylic substrate comprises a retroreflective substrate.

4,181,767
PLASTER BOARD PANELS

Peter Steinau, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,414

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1977, 2718322

Int. Cl.[2] B32B *23/02, 23/06, 27/02, 9/06*

U.S. Cl. 428—219 **23 Claims**

1. A plaster board panel consisting essentially of a gypsum core having two sides, faced by a cardboard sheet on each side of the gypsum core, each sheet having a plurality of cardboard sheet layers, and one of said layers being the outermost layer, wherein at least the outermost cardboard sheet layer on one of the two sides contains 90 to 10% by weight of cellulose containing fibers, and from 10 to 90% by weight of polyolefin fibrides, relative to dry matter.

12. A process for the manufacture of a plaster board panel consisting essentially of a gypsum core having two sides and a cardboard sheet bonded to each of the two sides of the gypsum core, the cardboard sheet including a plurality of cardboard sheet layers, comprising the steps of

introducing a gypsum paste between two cellulose containing cardboard sheets to form a panel, the outermost layer of at least one of the cardboard sheets containing from 90% to 10% by weight cellulose containing fibers and from 10 to 90% by weight polyolefin fibrides, relative to dry matter, and

subjecting the panels to a heat treatment for a period of time and at a temperature sufficient to plastify the polyolefin fibrides.

4,181,768
BODY ARMOR LAMINATE

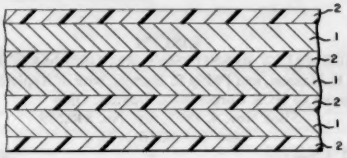
Gerard E. Severin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1974, Ser. No. 519,644

Int. Cl.[2] B32B *27/04;* **F41H** *1/02*

U.S. Cl. 428—252 **2 Claims**

1. A laminate useful for body armor comprising alternate layers of a fabric woven from poly(p-phenylene terephthalamide) yarn with intervening layers of polyhexamethylene adipamide film, said fabric layers being bonded into a rigid composite by means of polymer of the film layers with only minimal presence of the film polymer in the yarn bundles of the fabric layers, the film constituting from about 10 to 30% by weight of



the laminate and the fabric constituting from about 70 to 90% by weight of the laminate.

4,181,769
HETEROPOLYMER ACRYLIC LATICES AND TEXTILES TREATED THEREWITH

Joseph E. Plamondon, Holland; William R. Wilber, Quakertown, and Stephen Goth, Southampton, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 697,171, Jun. 17, 1976, Pat. No. 4,107,120. This application Sep. 29, 1977, Ser. No. 837,964

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—253 **20 Claims**

1. An article of manufacture comprising a textile material treated with a polymeric composition formed from acrylic latex particles, said latex particles comprising about 30–60% by weight of a polymeric core and about 70–40% by weight of a polymeric shell, wherein said core is formed by emulsion polymerization of a first monomer composition consisting essentially of:

(a) a major amount of a principal monomer system, and

(b) a minor amount of a crosslinking monomer system comprising:

(i) about 0.5% to 6% by weight on the total monomer composition of a graftlinking monomer or an active crosslinking monomer, and

(ii) about 4% to 10% by weight on the total monomer composition of a latent crosslinking monomer;

and wherein said shell if formed on said core by emulsion polymerization of a second monomer composition in the presence of said core, said second monomer composition consisting essentially of:

(a) a major amount of a principal monomer system; and

(b) about 2% to 10% on the total second monomer composition of a latent crosslinking monomer; the monomers of said first monomer composition being selected to provide a T_g in said core of −20° C. or lower, and the monomers of said second monomer composition being selected to provide a T_g in said shell of about 60° C. to about −10° C.

4,181,770
ISOCYANATE-TERMINATED BRANCHED POLYETHYLENE GLYCOL AND POLYESTER POLYURETHANE FOAMS

Günter Schuhmacher, Weinheim; Walter Föttinger, Mannheim; Adolf Gräber, and Erich Fahrbach, both of Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Nov. 25, 1975, Ser. No. 635,185

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456813

Int. Cl.[2] B32B *27/40;* **C08G** *18/77;* **B32B** *31/00;* **C08G** *18/14*

U.S. Cl. 428—260 **9 Claims**

1. A hydrophilic sheet of polyurethane-based foam comprising the product of reacting in the presence of water (A) a major amount of an isocyanate terminated branched polyethylene polyol prepolymer, (B) a minor amount of an isocyanate terminated polyester-diol prepolymer, and (C) a minor amount

of a liquid 4,4'-diphenylmethane-diisocyanate/polycarbodiimide condensation product with a 30% NCO content.

2. A sheet according to claim 1, having a textile reinforcement.

4,181,771
THERMALLY RESPONSIVE RECORD MATERIAL

Duane E. Hanson, and Philip R. Bartels, both of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 4, 1977, Ser. No. 848,579
Int. Cl.² B32B 5/16
U.S. Cl. 428—327 **34 Claims**

1. A thermally responsive record material comprising a substrate coated with a substantially colorless chromogeneous compound, a phenolic compound which is capable of liquefying and/or vaporizing at normal thermographic temperatures and thereby to react with said substantially colorless chromogeneous compound to form a colored mark, a substantially water-insoluble, cross-linked urea-formaldehyde agglomerated resin pigment in highly dispersed particulate form, and a suitable binder therefor.

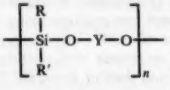
25. A process for the preparation of thermally responsive record material which comprises (A) preparing separate aqueous dispersions comprising (1) substantially colorless chromogenic material and a binder, (2) a phenolic compound which is capable of liquefying and/or vaporizing at normal thermographic temperatures and thereby to react with said substantially colorless chromogeneous compound to form a colored mark, a binder and a lubricant or wax, and (3) a substantially water-insoluble, cross-linked urea-formaldehyde agglomerated resin pigment in highly dispersed particulate form, (B) blending said dispersions to provide a coating formulation, and (C) coating said formulation on a substrate sheet.

4,181,772
ADHESIVE GENERATOR OVERCOATED PHOTORECEPTORS

Joseph Y. C. Chu, Fairport; Richard L. Schank, Webster, and Simpei Tutihasi, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1978, Ser. No. 969,041
Int. Cl.² G03G 5/04; B32B 5/16
U.S. Cl. 430—58 **19 Claims**

1. An adhesive generating layer for use in an overcoated photoreceptor system, this layer being comprised of a generating pigment dispersed in a copolymer of a siloxane and a dihydroxy compound of the formula:



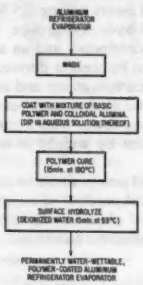
wherein R and R' are independently selected from the group consisting of alkyl, substituted alkyl, alkenes, substituted alkenes, aryl and substituted aryl; Y is a dihydroxy radical; and n is a number of sufficient value that the average molecular weight of the resulting silicone copolymer is between about 2,000 and 250,000.

18. An adhesive generating layer in accordance with claim 1 wherein the overcoated photoreceptor system comprises an electrically conductive substrate, overcoated with a layer capable of injecting holes into a layer on its surface, this layer being comprised of carbon black or graphite dispersed in a polymer, a hole transport layer in operative contact with the layer of hole injecting material, overcoated with a layer of charge generating material containing a generating pigment dispersed in a copolymer of a siloxane and a dihydroxy compound, this layer being on in an operative contact with the charge transport layer and a top layer of an insulating organic resin overlaying the layer of charge generating material whereby the charge generating material provides that the permanent adhesion of the generating layer to the insulating overcoating layer.

4,181,773
PROCESS FOR RENDERING SURFACES PERMANENTLY WATER WETTABLE AND NOVEL PRODUCTS THUS-PRODUCED

Milton E. Rickert, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 29, 1978, Ser. No. 891,440
Int. Cl.² B32B 5/16
U.S. Cl. 428—329 **19 Claims**


ALUMINUM REFRIGERATOR EVAPORATOR
WASH
COAT WITH MIXTURE OF BASIC POLYMER AND COLLOIDAL ALUMINA (DIP IN AQUEOUS SOLUTION THEREOF)
POLYMER CURE (Ovnin. at 60°C)
SURFACE HYDROLYZE (DEIONIZED WATER (5min. at 93°C)
PERMANENTLY WATER-WETTABLE, POLYMER-COATED ALUMINUM REFRIGERATOR EVAPORATOR

1. A process for rendering permanently water wettable a surface of an article of manufacture which is not permanently water wettable, which comprises the steps of:

(a) coating the surface with a continuous film, containing colloidal alumina, of a water soluble form of a film forming basic polymer which is curable to water insolubility;

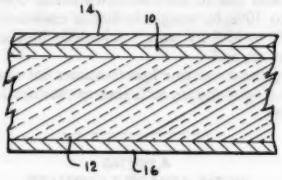
(b) curing the coated polymer on the substrate surface to water insolubility; and

(c) thereafter rendering the cured coating water wettable by hydrolyzing substantially only the surface portion of the cured polymer.

4,181,774
ELECTROMAGNETIC INTERFERENCE FILTER WINDOW

Jerry P. Wendt, Arcadia, Calif., and Andrew J. Steckl, Ballston Spa, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 19, 1978, Ser. No. 970,947
Int. Cl.² B32B 17/06; C03C 17/22
U.S. Cl. 428—335 **3 Claims**



1. A laser window material comprising

(a) a glass substrate;

(b) a thin sputtered coating of an indium tin oxide alloy deposited on one surface of said substrate;

(c) a first, thin, magnesium fluoride coating deposited on said sputtered coating; and

(d) a second, thin, magnesium fluoride coating deposited on the other surface of said substrate.

4,181,775
ADHESIVE

Nicholas T. Corke, Linden, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

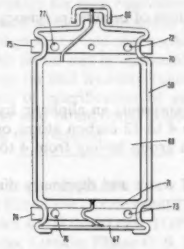
Filed May 19, 1977, Ser. No. 798,479
Claims priority, application United Kingdom, May 24, 1976, 21467/76; Feb. 15, 1977, 6248/77
Int. Cl.[2] C08K *5/01*
U.S. Cl. 428—348 20 Claims

16. A heat shrinkable polymeric article at least one principal surface of which is coated with an adhesive composition consisting essentially of (a) 100 parts by weight of a polyamide having a number average molecular weight of from 2,000 to 10,000; a softening point of from 90° C. to 150° C. and an amine equivalent of from 70 to 400; and (b) from 5 to 50 parts by weight of a wax having a melting point in the range of 90° C. to 140° C. and a solid to liquid transition over a temperature range of not more than 30° C. as measured by DSC.

4,181,776
CHEMOELECTRIC CELL

Olle B. Lindstrom, Taby, Sweden, assignor to AB Olle Lindstrom, Taby, Sweden

Continuation of Ser. No. 696,925, Jun. 17, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,606
Claims priority, application Sweden, Jun. 18, 1975, 7507041
Int. Cl.[2] H01M *12/04*
U.S. Cl. 429—27 13 Claims



1. A chemoelectric cell comprising:
a positive electrode,
a negative electrode spaced from said positive electrode to define an interspace therebetween for conducting electrolyte,
one of said electrodes comprising a gas electrode having one side facing said interspace,
a porous separator disposed in said interspace and abutting against said side of said gas electrode,
said separator defining passageways open toward said side of said gas electrode for conducting gaseous substance from an inlet end to an outlet end of said interspace;
portions of said side of said gas electrode located along said passageways being coated with electrolyte repellant material,
means for delivering electrochemically active gaseous substance into said passageways for travel along and reaction with said portions of said side of said gas electrode that are coated by said electrolyte repellant material, and
means for delivering liquid electrolyte to said interspace to impregnate said separator so that electrolyte is in contact with areas of said side of said gas electrode which are abutted by said separator.

4,181,777
RECHARGEABLE ZINC HALOGEN BATTERY

Placido M. Spaziante, and Antonio Nidola, both of Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

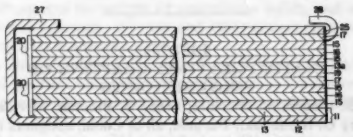
Filed Sep. 7, 1978, Ser. No. 940,272
Int. Cl.[2] H01M *10/36, 12/08*
U.S. Cl. 429—50 25 Claims

1. An improved rechargeable zinc halogen battery comprising a cell having a normally positive electrode for reducing a halogen disposed in electrical contact therewith and a normally negative electrode for oxidizing zinc disposed in electrical contact therewith during electrical discharge of the battery and an aqueous electrolyte containing ions of zinc and halogen and containing 1 to 50 ppm of an ion of at least one metal selected from the group consisting of lead, molybdenum, tungsten, chromium, vanadium, cadmium, copper, germanium, arsenic, antimony, bismuth, selenium and tellurium and an amount of at least one additive of the group consisting of a polysaccharide and sorbitol sufficient to prevent zinc dendrite formation during electrical charge of the battery.

4,181,778
NOVEL BATTERY ANODE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 443,126, Feb. 15, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,855
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—53 12 Claims



1. In a planar battery which comprises, in combination and in superposed relationship, electrical energy generating components including:
(a) a planar end cell anode;
(b) a planar cathode comprising manganese dioxide/carbon black superposed substantially coextensive the anode;
(c) a planar separator positioned intermediate and extending substantially coextensive the facing surfaces of the anode and the cathode; and
(d) a solution of an electrolyte comprising ammonium chloride/zinc chloride disposed in the separator and in contact with the facing surfaces of the anode and the cathode;
the improvement which comprises said end cell anode comprising a zinc sheet carrying a layer of zinc particles on the surface thereof next adjacent said cathode, wherein both said sheet and said particles are in contact with said electrolyte.

4,181,779
CELL USING HALOGEN REACTIVE MATERIAL SUCH AS ORGANO-METALLIC POLYMER

Boon K. Teo, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 30, 1979, Ser. No. 7,817
Int. Cl.[2] H01M *6/04*
U.S. Cl. 429—199 11 Claims

1. A battery cell comprising a first electrode, a liquid electrolyte comprising an alkali halide and a second electrode,
characterized in that said first electrode comprises an organo-metallic polymer having the nominal composition $[M(TTL)]_x$ in which M comprises at least one transition metal ion selected from group VIII of the periodic table,

TTL has the nominal atom composition $C_{10}H_4X_4$, and represents both substituted and unsubstituted TTL, X selected from the group consisting of S, Se, Te and mixtures thereof, and x is greater than or equal to 1.

4,181,780

THERMOPLASTIC IONOMER FOAMS

Douglas Brenner, Livingston, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 855,727, Nov. 29, 1977, Continuation-in-part of Ser. No. 839,172, Oct. 4, 1977. This application Jan. 5, 1979, Ser. No. 1,317

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 521—93 **7 Claims**

1. A foamed article comprising:

(a) a neutralized sulfonated elastomeric polymer, said sulfonated elastomeric polymer being formed from an EPDM terpolymer, said sulfonated elastomeric polymer having about 10 to about 100 meq. neutralized sulfonate groups/100 gl of said sulfonated elastomeric polymer;

(b) at least 8 parts by weight of a solid non-volatile preferential plasticizer per 100 parts of said neutralized sulfonated elastomeric polymer, said preferential plasticizer plasticizing the sulfonate groups, said preferential plasticizer being selected from the group consisting of fatty acids having about 12 to about 40 carbon atoms, metallic salts of said fatty acids, amides, ureas, amines and thioureas, said article having a density of about 2 to about 50 pounds per cubic foot.

4,181,781

IN-SITU POLYVINYL GRAFTING OF POLYURETHANES

Kiran B. Chandalia, Cheshire; Frank J. Preston, Meriden, and Henry G. Barnowski, Durham, all of Conn., assignors to Olin Corporation, New Haven, Conn.

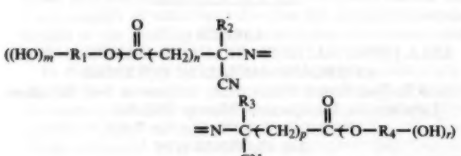
Filed May 30, 1978, Ser. No. 910,414

Int. Cl.[2] **C08G** *18/63, 18/14, 18/16*

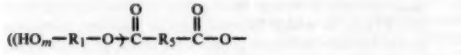
U.S. Cl. 521—137 **17 Claims**

1. In a process for preparing a polyurethane composition from a reaction mixture comprising a polyol reactant and an organic polyisocyanate, the improvement characterized by effecting simultaneous co-reactions of polyvinyl grafting and polyurethane formation by including in said reaction mixture an ethylenically unsaturated monomer or a mixture of such monomers, in an amount ranging from about 1.0 to about 30.0 percent by weight based on the weight of the total polyol in the reaction mixture, together with a di-ester polyol, or a mixture of such di-ester polyols, in an amount ranging from about 0.5 to about 20.0 percent by weight based on the weight of the total polyol in the reaction mixture, said di-ester polyols selected from;

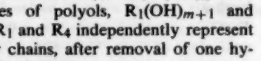
azo di-ester polyols of the formula:



and peroxy di-ester polyols of the formula:



-continued



wherein:

m and r independently are integers from 1 to 5;

n and p independently are integers from 0–5;

R_2 and R_3 independently are alkyl of 1–4 carbons;

R_5 and R_6 independently are radicals selected from aryl and alkenyl of 2–5 carbons; and

the groups $((HO)_m—R_1—O—$ and $—(O—R_4—(OH)_r)$ independently are residues of polyols, $R_1(OH)_{m+1}$ and $R_4(OH)_{r+1}$, wherein R_1 and R_4 independently represent polyether or polyester chains, after removal of one hydroxy hydrogen therefrom.

4,181,782

PREPARATION OF POLYISOCYANATES HAVING BIURET GROUPS AND THEIR USE IN SYNTHETIC FOAMED RESINS AND LACQUERS

Edgar Möhring, Bergisch Gladbach; Kuno Wagner, and Hanns P. Müller, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 789,902, Apr. 22, 1977, Pat. No. 4,127,599. This application Nov. 13, 1978, Ser. No. 960,418

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619548

Int. Cl.[2] **C08G** *18/14;* **C07C** *127/24;* **C08G** *18/77*

U.S. Cl. 521—162 **6 Claims**

1. In an isocyanate polyaddition process for the production of polyurethane resins, the improvement comprising reacting

a. polyisocyanates having biuret groups produced by reacting

i. excess quantities of organic polyisocyanates of the formula

$$Q(NCO)_2$$

wherein Q represents an aliphatic hydrocarbon group having from 4 to 12 carbon atoms or a cycloaliphatic hydrocarbon group having from 4 to 15 carbon atoms with

ii. a mixture of water and diprimary diamines of the formula

$$R'(NH_2)_2$$

wherein R′ represents an aliphatic hydrocarbon group having 2 to 12 carbon atoms, a cycloaliphatic hydrocarbon group having 4 to 17 carbon atoms, or an araliphatic hydrocarbon group having 8 to 10 carbon atoms, with

b. polyhydroxyl compounds.

4,181,783

HIGH SOLIDS COATING COMPOSITION ADAPTED FOR USE AS AUTOMOTIVE TOPCOAT—#4

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 864,964, Dec. 27, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,029

Int. Cl.[2] **C08L** *63/08*

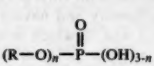
U.S. Cl. 525—161 **20 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendent epoxy functionality, having a number average molecular weight (Mn) of between about 1500 and

about 10,000 and a glass transition temperature (Tg) of between about 31 25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomer bearing hydroxy functionality, with the total of said glycidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising hydroxy functional organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from the group consisting of mono or dihydroxy alkyl, cycloalkyl, or aryl radicals;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000, said organophosphate ester being included in said composition in an amount sufficient to provide between about 0.67 and about 1.4 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said organophosphate ester, (ii) a hydroxyl group on on said bifunctional copolymer, (iii) a hydroxyl group on said hydroxy functional additive, or (iv) as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,181,784

HIGH SOLIDS COATING COMPOSITION ADAPTED FOR USE AS AUTOMOTIVE TOPCOAT—#1

Mohinder S. Chattha, Livonia; Elaine C. S. Beckwith, Trenton, and Henk van Oene, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 864,958, Dec. 27, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,030

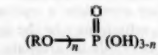
Int. Cl.[2] C08L *63/08*

U.S. Cl. 525—161 **14 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60 percent by weight of nonvolatile solids, and which exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight (M_n) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) at least one organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from the alkyl, cycloalkyl or aryl groups;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6,000,

said organophosphate ester being included in said composition in an amount sufficient to provide between about 0.67 and about 1.4 equivalents of acid functionality for each equivalent of pendant epoxy functionality on said copolymer and said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.67 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as a hydroxyl group on said hydroxy functional additive or as a result of esterification of said copolymer during cure of said coating composition.

4,181,785

HIGH SOLIDS COATING COMPOSITION ADAPTED FOR USE AS AUTOMOTIVE TOPCOAT- #2

Mohinder S. Chattha, Livonia; Elaine C. Siwiec Beckwith, Trenton, and Henk van Oene, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 864,959, Dec. 27, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,031

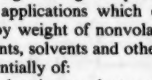
Int. Cl.[2] C08L *63/08*

U.S. Cl. 525—161 **16 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60 percent by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendant epoxy functionality, having a number average molecular weight (M_n) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C. said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing hydroxy functionality, with the total of said monoethylenically unsaturated monomers bearing either said glycidyl functionality of said hydroxy functionality being not greater than about 30 weight percent of said copolymer, and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) At least one organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from alkyl, cycloalkyl or aryl radicals;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6,000;

said organophosphate ester being included in said composition in an amount sufficient to provide between about 0.67 and about 1.4 equivalents of acid functionality for each equivalent of pendant epoxy functionality on said bifunctional copolymer, and said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.67 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition (i) as a hydroxyl group on

said hydroxy functional additive, (ii) as a hydroxyl group on said bifunctional copolymer, or (iii) as the result of esterification of the pendant epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,181,786

ANTIBACTERIAL AND ANTIFUNGAL MATERIAL

Isao Mune; Keiichi Ushiyama; Kenitiro Saito; Yutaka Moroishi, and Tadaichi Nakao, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Mar. 6, 1978, Ser. No. 883,988

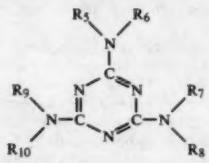
Claims priority, application Japan, Mar. 4, 1977, 52/24095; Mar. 4, 1977, 52/24096

Int. Cl.[2] C08F *20/04, 20/06*

U.S. Cl. 525—327 **14 Claims**

1. An antibacterial and antifungal material comprising a polymer containing carboxyl groups, but not containing any cyano groups, in an amount of at least about 0.008 milliequivalent per gram of said polymer and silver ions ionically bonded to said carboxyl groups in an amount of at least about 0.0009 millimole per gram of said polymer.

8. The antibacterial and antifungal material of claim 1, wherein said polymer additionally contains melamine and/or a derivative thereof represented by the general formula (III):



(III)

wherein R_5 to R_{10}, which may be the same or different, each represents a hydrogen atom, $-CH_2OH$ or $-CH_2OC_nH_{2n+1}$ and wherein n is an integer of 1 to 4 and said silver ions are ionically bonded to and chelated with said melamine and/or said derivative thereof and said carboxyl groups.

4,181,787

VINYL HALIDE POLYMERIZATION PROCESS AND REACTOR THEREFOR

Malcolm P. McOnie, St. Albans; Philip D. Roberts, Harpenden; John B. Rose, Letchworth, all of England, and Boris Englin, Chadstone, Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Dec. 19, 1977, Ser. No. 862,298

Claims priority, application Australia, Dec. 23, 1976, 8604/76; May 4, 1977, 9981/77

Int. Cl.[2] C08F *2/10*

U.S. Cl. 526—62 **22 Claims**

1. A process for the polymerisation of vinyl halide monomers in aqueous dispersion wherein polymerisation is carried out in a reactor having adherently deposited on internal surfaces thereof a coating of a coating product comprising the reaction admixture of at least polyethyleneimine and one or more of hydroquinone, p-benzoquinone, catechol and o-benzoquinone.

4,181,788

PROCESS FOR THE PRODUCTION OF THERMOPLASTIC MOLDING MATERIALS BASED ON VINYL POLYMERS

Frank Wingler; Lothar Liebig; Gerd Wassmuth; Martin Ullrich, and Manfred Hederich, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed May 23, 1978, Ser. No. 908,763

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724360

Int. Cl.[2] C08F *6/10*

U.S. Cl. 526—68 **3 Claims**

1. A process for the production of thermoplastically processible moulding materials based on vinyl polymers of high chemical and molecular uniformity and having residual monomer contents of less than 0.1 mol % which comprises the steps of:

(i) mass homogeneous phase polymerization of at least one vinyl monomer in a stirred continously charged tank reactor to a conversion of from 25 to 60 mol %;

(ii) directly concentrating the syrup consisting of residual monomers and vinyl polymer dissolved therein obtained from step (i) in a spiral tube evaporator at a temperature of from 60° to 250° C. and at a pressure of 100 m bar to 35 bar to obtain a solid content of vinyl polymer of from 40 to 90 mol %;

(iii) directly charging the concentrate obtained from step (ii) to the inlet zone of a screw evaporator which consists of at least two sequential zones in order to effect further concentration, in which a first zone at a pressure of from 10 to 300 m bar and at a temperature of from 100° to 250° C. concentrates the vinyl polymer to a solid content of from 80 to 99 mol %, and each subsequent zone at a pressure of 1 to 200 m bar and at a temperature of 150° to 250° C. concentrates the vinyl polymer to a solid content of at least 99.9%; and

(iv) recycling the residual monomers from step (ii) and the residual monomers from said first zone of the screw evaporator to the stirred and charged tank reactor without intermediate cleaning.

4,181,789

POLYPARABANIC ACID DERIVATIVES AND PROCESS THEREFOR

Henning Giesecke, Cologne; Jurgen Hocker, Bergisch Gladbach, and Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

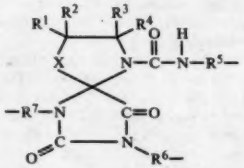
Filed Sep. 22, 1978, Ser. No. 944,748

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743517

Int. Cl.[2] C08G *18/30, 18/38;* **C07D** *263/04*

U.S. Cl. 528—73 **9 Claims**

1. A polyparabanic acid derivative having a recurrent structural unit of the formula



wherein X is O or S; each of R^1, R^2, R^3 and R^4, which may be the same or different, when taken separately in hydrogen or an aliphatic, aromatic or aliphatic-aromatic group; R^1 and R^2 when taken together complete a cycloalihatic ring and R^3 and R^4 when taken together complete a cycloaliphatic ring and each of R^5, R^6 and R^7, which may be the same or different, is an aliphatic, aromatic or aliphatic-aromatic residue or an organic isocyanate after removal of at least one isocyanate group.

4,181,790

COPOLYMERIZATION OF ETHYLENE EMPLOYING AN ORGANIC CHLORINE COMPOUND-ACTIVATED ZIEGLER-NATTA CATALYST

Günther Maahs; Konrad Rombusch, and Wolfgang Zaar, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, Aktiengellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 19,066

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810396

Int. Cl.² C08F *4/76*

U.S. Cl. 526—143 **6 Claims**

1. In a process for the production of copolymers of ethylene by the polymerization of an olefinic mixture of ethylene and at least one other 1-monoolefin monomer, alone or in admixture with a non-conjugated hydrocarbon diene monomer, employing as the polymerization catalyst an organic chlorine compound-activated Ziegler-Natta catalyst, the improvement which comprises employing, as the organic chlorine compound, a hydrocarbon ester or halohydrocarbon ester, each of up to 15 carbon atoms in the hydrocarbon group, of 2,3,4,4-tetrachloro-3-butenoic acid.

4,181,791

PROCESS FOR PREPARING ARALKYLENE PHENOL RESINS PREPARED FROM PHENOLS AND ARALKYLENE ESTERS

Alfred G. Edwards, Stourport-on-Severn, and Glyn I. Harris, Hagley, both of England, assignors to Albright & Wilson Limited, Warley, England

Filed Oct. 6, 1975, Ser. No. 620,534

Claims priority, application United Kingdom, Oct. 7, 1974, 43345/74

Int. Cl.² C08G *63/10, 63/18, 75/26*

U.S. Cl. 528—179 **13 Claims**

1. A process for preparing a curable resin containing phenolic groups, which comprises reacting

(1) an aralkylene ester of formula $R'(CH_2OYR)_a$, wherein R' is a radical selected from the group consisting of divalent or trivalent aromatic hydrocarbyl groups and aromatic hydrocarbyl-oxy-aromatic hydrocarbyloxy groups, each of which may be substituted with at least one substituent selected from the group consisting of alkyl of 1–4 carbon atoms, halogen atoms and a phenyl group, R is a radical selected from the group consisting of alkyl groups of 1 to 6 carbon atoms and aryl groups of 6–13 carbon atoms, Y is a radical selected from the group consisting of carbonyl and sulphonyl groups, and a is 2 or 3, with

(2) a molar excess of a phenolic component which also may be substituted by non-hydroxylic substituents which are inert under the reaction conditions,

said reaction being carried out in the presence of a catalyst for condensation of ester groups with nuclear hydrogen atoms in the phenolic compound, said catalyst being selected from Friedel Crafts type catalysts, and dialkyl sulphates with 1–6 carbon atoms in each alkyl group, at a temperature between 100° and 200° C.

4,181,792

LIQUID CRYSTAL COPOLYESTERS CONTAINING TEREPHTHALIC ACID, ISOPHTHALIC ACID, 2,6-NAPHTHALENEDICARBOXYLIC ACID AND HYDROQUINONE

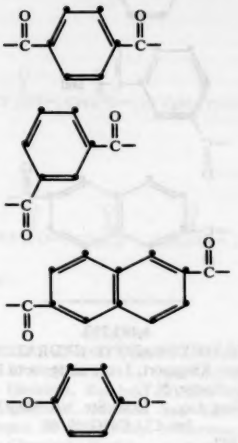
Winston J. Jackson, Jr., and John C. Morris, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,257

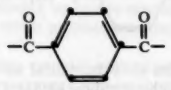
Int. Cl.² C08G *63/18*

U.S. Cl. 528—190 **2 Claims**

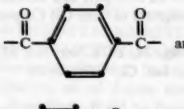
1. A copolyester having a fiber forming molecular weight consisting essentially of the following divalent radicals:



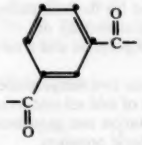
wherein the range of



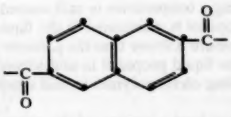
is from 30 to 80 mole percent, based on the total moles of



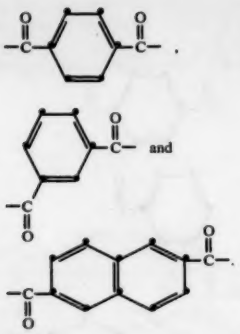
and



and the range of



is from 15 to 60 mole percent, based on the total moles of



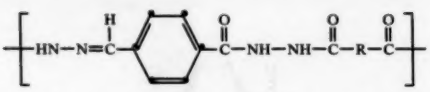
4,181,793

POLY(HYDRAZONE-HYDRAZINE)

Harry R. Musser, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,227
Int. Cl.[2] C08G 69/08
U.S. Cl. 528—327 3 Claims

1. A film-forming poly(hydrazone-hydrazide) composed of recurring units of the structure



where R is a divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 1 to 40 carbon atoms or a divalent aromatic radical having 6 to 16 carbon atoms.

4,181,794

METHOD FOR MANUFACTURE OF OLEFIN POLYMER FIBRILS

Jin K. Kim; Clarence R. Murphy, and Edward W. Smith, all of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1978, Ser. No. 937,353
Int. Cl.[2] C08F 6/06
U.S. Cl. 528—496 11 Claims

1. A continuous method for the manufacture of olefin polymer fibrils which consists essentially of:

a. Introducing an olefin polymer and a solvent therefor into a first zone,
b. Heating said first zone to a temperature above the atmospheric boiling point of said solvent so as to maintain said olefin polymer in solution and to maintain said first zone under super-atmospheric pressure,
c. Transferring polymer solution from said first zone to a second zone through an elongated tube-like transfer member,
d. Feeding a propanol to said second zone to continuously maintain liquid propanol above the discharge orifice of the transfer member,
e. Maintaining a temperature in said second zone such that:
(i) the propanol is maintained in the liquid state, and
(ii) the pressure is lower than the pressure in the first zone,
f. Stirring the liquid propanol in said second zone,
g. Precipitating olefin polymer in said second zone to form fibrils,
h. Distilling at least a portion of the polymer solvent from said second zone,
i. Removing a slurry of fibrils and propanol from said second zone,
j. Flash distilling the bulk of any polymer solvent remaining in the slurry recovered in step (i),
k. Passing the fibril-propanol slurry from step (j) through refining apparatus to refine the fibrils,
l. Recovering refined fibrils and propanol from the slurry of step (k), and
m. Recovering the polymer solvent and propanol and recycling same to steps (a) and (d) of the process;

the solvent employed in step (a) being characterized in (1) having the capacity of dissolving at least about 1.0 weight % of the olefin polymer at the temperature employed in step (b), (2) having the capacity of dissolving not more than about 0.2 weight % of the olefin polymer at ambient temperature when diluted with an equal volume of propanol, (3) having an atmospheric boiling point of less than about 65° C. and (4) not forming an azeoptrope with the propanol employed in step (d).

4,181,795

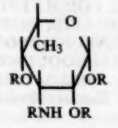
DAUNOSAMINE SYNTHESIS

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed May 22, 1978, Ser. No. 908,240
Int. Cl.[2] C07H 15/00, 17/00
U.S. Cl. 536—4 21 Claims

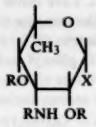
1. A process for making methyl 3-substituted amino-2,3,6,-trideoxy-β-L-lyxo-hexopyranoside comprising:

(a) reacting 1,2:5,6-di-O-isopropylidene-3-amino-3-deoxy-α-D-allofuranose with a compound containing a blocking group whereby a blocking group is introduced on the amino group;
(b) reacting the resultant 1,2:5,6-di-O-isopropylidene-3-substituted amino-3-deoxy-α-D-allofuranose with a weak acid to produce 1,2-O-isopropylidene-3-substituted amino-3-deoxy-α-D-allofuranose;
(c) subjecting the resultant 1,2-O-isopropylidene-3-substituted amino-3-deoxy-α-D-allofuranose to benzoylation and tosylation to produce 1,2-O-isopropylidene-3-substituted amino-6-O-benzoyl-5-O-tolylsulfonyl-3-deoxy-α-D-allofuranose;
(d) removing the benzoate group, and the toluene sulfonate group from the resultant 1,2-O-isopropylidene-3-substituted amino-6-O-benzoyl-5-O-tolysulfonyl-3-deoxy-α-D-allofuranose by condensing them in a low molecular weight alcohol, under basic conditions, to produce 1,2-O-isopropylidene-3-substituted amino-5,6-anhydro-3-deoxy-β-L-talofuranose;
(e) reducing 1,2,-O-isopropylidene-3-substituted amino-5,6-anhydro-3-dideoxy-β-L-talofuranose to produce 1,2,-O-isopropylidene-3-substituted amino-3,6-deoxy-β-L-talofuranose;
(f) reacting the resultant 1,2-O-isopropylidene-3-substituted amino-3,6-dideoxy-β-L-talofuranose with a strong acid and reacting the resultant product with a compound containing a blocking group, whereby a blocking group containing product is formed corresponding to the formula



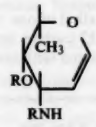
wherein R is a blocking group:

(g) halogenating the resultant blocking group containing product to produce a halogenated derivative corresponding to the formula



wherein R is a blocking group and X is halogen;

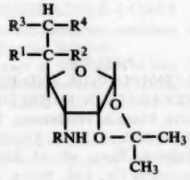
(h) reducing the resultant chlorinated or brominated derivative to form a glycal having the formula



wherein R is said blocking group; and

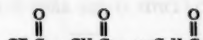
(i) subjecting said glycal to methoxymercuration and reducing the resultant product whereby methyl 3-substituted amino-2,3,6,-trideoxy-β-L-lyxo-hexopyranoside is formed.

14. A compound having the formula



wherein

R is H,



R^1 is H, HO-, $CH_3C_6H_4SO_2O$—; or CH_3SO_2O—;

R^2 is H, —OH, or, in combination with R^4, >O;

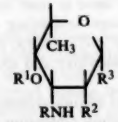
R^3 is H, HO—, or

and

R^4 is H or, in combination with R^2, >O;

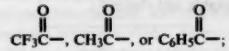
provided that one of R^1 or R^2 and one of R^3 or R^4 must be H, and at least one of R^1, R^2, R^3, and R^4 must be other than H.

19. A compound of the formula

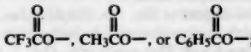


wherein

R and R^1, which may be the same or different, are

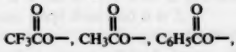


R^2 is



and

R^3 is



Cl—, or Br—.

4,181,796

PROCESS FOR OBTAINING XYLAN AND FIBRIN FROM VEGETABLE RAW MATERIAL CONTAINING XYLAN

Hans-Hermann Dietrichs, Reinbek; Michael Sinner, Dassendorf; Fritz Opderbeck, Münich, and Karl-Heinz Brachthauser, Ratingen, all of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschrankter Haftung, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,464

Claims priority, application Austria, Jul. 20, 1976, 5346/76

Int. Cl.[2] **C07H** *1/06, 1/08*

U.S. Cl. 536—1 **10 Claims**

1. A process for the production of xylan and fibrinous material from xylan-containing vegetable raw material which can be disintegrated by steam pressure treatment and defibration comprising the steps of

(a) treating the raw material with saturated steam under pressure at a temperature of from about 175°–220° C. for a period of two minutes to four hours,

(b) lixiviating the treated vegetable raw material with aqueous solution whereby xylan and xylan fragments are extracted from the disintegrated raw material producing an aqueous xylan extract solution and a fibrinous residue.

4,181,797

1-N-(ω-AMINO-α-HYDROXYALKANOYL) DERIVATIVES OF 4'-DEOXY-6'-N-METHYLKANAMYCIN A

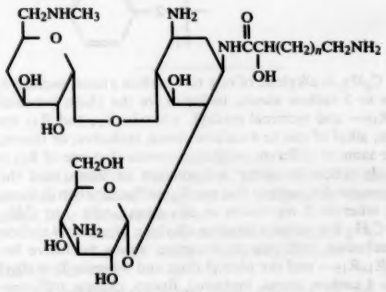
Takayuki Naito, Kawasaki; Susumu Nakagawa, Tokyo, and Soichiro Toda, Ohmiya, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,283

Int. Cl.[2] **A61K** *31/71;* **C07H** *15/22*

U.S. Cl. 536—10 **5 Claims**

1. A compound of the formula



XVI

in which n is an integer of from 0 to 2, or a nontoxic, pharmaceutically acceptable salt thereof.

4,181,798

METHYLENECYCLOPENTANE DERIVATIVES

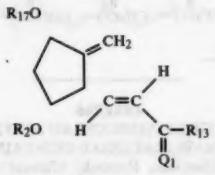
Douglas R. Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 764,332, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,792, Jun. 1, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,688

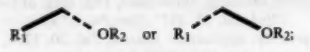
Int. Cl.[2] C07D *407/08*

U.S. Cl. 542—426 **19 Claims**

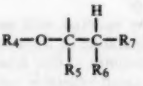
1. A compound of the formula



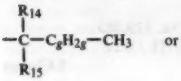
wherein Q_1 is



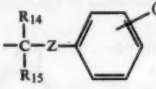
wherein R_1 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is tetrahydropyranyl, tetrahydrofuranyl, or a group of the formula



wherein R_4 is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_5 and R_6 taken together are $-(CH_2)_b-O-(CH_2)_c-$ wherein b is one, 2, or 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and wherein R_7 is hydrogen or phenyl; wherein R_{13} is

 (1)

or

 (2)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_{14}R_{15}-$ and terminal methyl, wherein R_{14} and R_{15} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_{14} is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_{14} nor R_{15} is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $CR_{14}R_{15}-$ and the phenyl ring; and wherein L is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or—OR_{16}—wherein R_{16} is alkyl of one to 4 carbon atoms, inclusive, and p is zero, one, 2, or 3, with the proviso that not more than two L's are other than alkyl and when p is 2 or 3 the L's are either the same or different; and wherein R_{17} is (1) silyl, $-Si(A)_3$ wherein A is alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one or 2 fluoro, chloro, or alkyl of one to 4 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive, the A groups being the same or different; (2) carboxyacyl, represented by the formula

wherein R_9 is hydrogen, alkyl of one to 9 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive, wherein alkyl or aralkyl are substituted with zero to 3 halo atoms; or (3) hydrogen.

4,181,799

5(6H), 8(8aH)-DIOXO-1H,3H-THIAZOLO[4,3-c][1,4]THIAZINE

Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,078

Int. Cl.[2] C07D *513/04*

U.S. Cl. 544—48 **1 Claim**

1. The compound 5(6H),8(8aH)-dioxo-1H,3H-thiazolo[4,3-c] [1,4]thiazine.

4,181,800

2-AZETIDINONE COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takashi Kamiya, Suita; Masashi Hashimoto, Toyonaka; Osamu Nakaguti; Teruo Oku, both of Osaka; Yoshiharu Nakai, Otsu, and Hidekazu Takeno, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

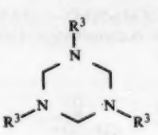
Filed Oct. 6, 1976, Ser. No. 730,012

Claims priority, application United Kingdom, Oct. 6, 1975, 40893/75; Jan. 2, 1976, 94/76; Jan. 5, 1976, 242/76; May 25, 1976, 21507/76; Jun. 21, 1976, 25746/76

Int. Cl.[2] C07D *251/00;* **A01N** *9/00*

U.S. Cl. 544—180 **35 Claims**

1. A compound of the formula:



wherein R^3 is a group of the formula:

in which

R_g^4 is hydrogen;

phenyl which may have at least one suitable substituent selected from groups consisting of C_1–C_3 alkanesulfonamido, phenyl (C_1–C_4)alkoxy, phenyl (C_1–C_2) alkoxycarbonyloxy, phenacyloxy and nitro;

naphthyl;

phenyl (C_1–C_5)alkyl having at least one suitable substituent selected from groups consisting of C_1–C_5 alkoxy in the alkyl moiety thereof and phenyl (C_1–C_4)alkoxy in the phenyl ring thereof;

phenylthio(C_1–C_5)alkyl;

thienyl;
or furyl; and

R_b^5 is carboxy or its ester selected from groups consisting of C_1–C_5 alkoxycarbonyl, phenyl(C_1–C_2)alkoxycarbonyl, phenacyloxycarbonyl or C_1–C_5 alkyl having C_1–C_5 alkoxycarbonyl.

4,181,801

PROCESS FOR PREPARING CYANURIC ACID

Mario G. R. T. de Cooker, and Anita G. W. G. Haemers, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 8, 1978, Ser. No. 903,400
Claims priority, application Netherlands, May 9, 1977, 7705050
Int. Cl.[2] C07D *251/32*
U.S. Cl. 544—192 **9 Claims**

1. In a process for preparing cyanuric acid by heating at least one of urea and biuret in a suitable solvent in a reactor wherein the resultant solid cyanuric acid mass is separated from the reaction mixture, the improvement which comprises feeding the cyanuric acid mass which contains amounts of solvent to a fluidized bed of cyanuric acid particles which is fluidized with a flow of an inert gas and from which purified cyanuric acid particles are withdrawn.

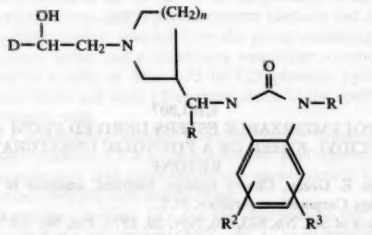
4,181,802

1-(HETEROCYCLYLALKYL)-1,3-DIHYDRO-2-H-BENZIMIDAZOLE-2-ONES

Ludo Kennis, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

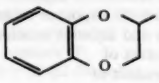
Continuation-in-part of Ser. No. 904,845, May 11, 1978, abandoned. This application Dec. 14, 1978, Ser. No. 969,513
Int. Cl.[2] C07D *405/14, 401/06, 403/06*
U.S. Cl. 546—199 **8 Claims**

1. A chemical compound selected from the group consisting of a 1,3-dihydro-2H-benzimidazol-2-one derivative having the formula



and the therapeutically acceptable acid addition salts thereof; wherein:

D is a member selected from the group consisting of the radicals Ar—X—CH_2— and



wherein X is selected from the group consisting of O and S and Ar is selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and 2,3-dihydro-1H-indenyl, wherein substituted phenyl is phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkenyl, lower alkynyl, lower alkyloxy, lower alkenyloxy, lower alkynyloxy, lower alkyloxy-lower alkyloxy, phenyl, cyano, lower alkanoyl, benzoyl, nitro, amino, lower alkanoylamino, mono- and di(lower alkyl)amino, aminocarbonylamino, phenylaminocarbonylamino, mono- and di(lower alkyl)aminocarbonylamino, lower alkylthio, phenyllower alkyl, 3-phenyl-2-propen-1-yloxy, aminocarbonyllower alkyl, mono- and di(lower alkyl)aminocarbonyllower alkyl and lower alkyloxycarbonyllower alkyl, provided that when more than 1 substituent is present only one thereof may be selected from the group consisting of phenyl, phenyllower alkyl, benzoyl, aminocarbonylamino, phenylaminocarbonylamino, mono- and di(lower alkyl)aminocarbonylamino, aminocarbonyllower alkyl, mono- and di(lower alkyl)aminocarbonyllower alkyl, lower alkyloxycarbonyllower alkyl, amino, nitro and cyano;

R is selected from the group consisting of hydrogen and lower alkyl; n is the integer 1 or 2, provided that when said R is lower alkyl then said n is 2;

R^1 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkyloxy-lower alkyl, phenoxylower alkyl, lower alkylcarbonyl-lower alkyl, cyano-lower alkyl, phenyl-lower alkyl, hydroxy-lower alkyl, di(lower alkyl)aminolower alkyl, 1-pyrrolidinyl-lower alkyl, 1-piperidinyl-lower alkyl and lower alkyloxycarbonyl-lower alkyl; and

R^2 and R^3 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy and trifluoromethyl.

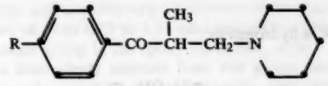
4,181,803

PROPIOPHENONE DERIVATIVES AND PREPARATION THEREOF

Eiichi Morita, and Takeo Kanai, both of Honjou, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 530,499, Dec. 6, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,073
Claims priority, application Japan, Dec. 14, 1973, 48-138808
Int. Cl.[2] C07D *295/10*
U.S. Cl. 546—237 **4 Claims**

1. A 4'-Substituted 2-methyl-3-piperidino-propiophenone derivative represented by the formula:



wherein R stands for a lower alkyl group having 2–3 carbon atoms or a pharmacologically acceptable acid-addition salt thereof.

4,181,804

ALLANTOIN UROCANIC ACID COMPLEXES

Sebastian B. Mecca, Abington, Pa., assignor to Carroll Products, Inc., Philadelphia, Pa.

Filed Jan. 10, 1979, Ser. No. 2,289
Int. Cl.[2] A61K *7/42*; C07D *233/88*
U.S. Cl. 548—311 **2 Claims**

1. An allantoin urocanic acid complex of the formula $[C_4H_5N_4O_3]_a{\cdot}[C_6H_6N_2O_2]_b$ wherein a and b are each about 1.

4,181,805

PROCESS FOR THE PREPARATION OF PURE SODIUM HYDROXIDE ADDITION COMPOUNDS OF CIS-ISOMERS OF NAPHTHOYLENE-BIS-BENZIMIDAZOLES

Josef Landler, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 6, 1979, Ser. No. 17,937

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809877

Int. Cl.[2] C07D *235/20*

U.S. Cl. 548—328 **14 Claims**

1. A process for obtaining a pure sodium hydroxide addition product of the cis-isomer of a naphthoylene-bis-benzimidazole from its aqueous-alcoholic alkaline solution, which comprises removing the alcohol, reacting the remaining essentially aqueous alkaline solution with chlorine gas or an alkali metal hypochlorite at a temperature between room temperature and about 90° C., removing insoluble by-products and adding to the remaining solution an amount of a compound yielding sodium ions sufficient to precipitate said addition product.

4,181,806

AMINOALKYLENEPHOSPHONIC ACIDS AND SALTS THEREOF AND THEIR USE IN AQUEOUS SYSTEMS

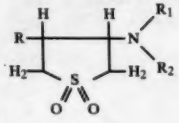
Joseph G. E. Fenyes, Germantown, and John D. Pera, Memphis, both of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Jun. 9, 1978, Ser. No. 914,250

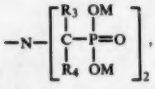
Int. Cl.[2] C07D *333/48*

U.S. Cl. 549—6 **17 Claims**

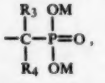
1. As a new composition of matter an aminoalkylenephosphonic acid or an alkali metal salt thereof having the formula:



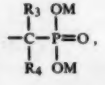
wherein R is hydrogen or

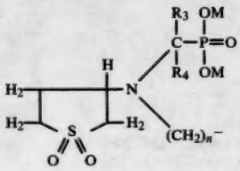


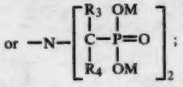
R_1 is hydrogen or



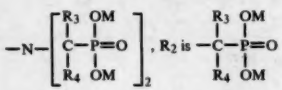
R_2 is an alkyl group containing 1 to 4 carbon atoms, 2-hydroxyethyl, 2-hydroxypropyl, 3-chloro-2-hydroxypropyl,



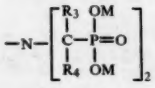




R_3 and R_4 may be the same or different and are selected from the group consisting of hydrogen and an alkyl group containing 1 to 4 carbon atoms; n is 1 or 2; M is hydrogen or an alkali metal; with the proviso that when R is



and with the further proviso that R_1 is hydrogen only when R_2 is



4,181,807

POLYMERIZABLE ESTERS DERIVED FROM A GLYCIDYL ETHER OF A PHENOLIC UNSATURATED KETONE

George E. Green, Cherry Hinton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 633,770, Nov. 20, 1975, Pat. No. 4,079,183. This application Dec. 27, 1977, Ser. No. 865,065

Claims priority, application United Kingdom, Nov. 30, 1974, 51972/74

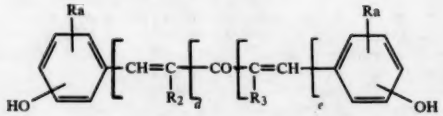
Int. Cl.[2] C07C *69/76, 69/95*

U.S. Cl. 560—52 **13 Claims**

1. An ester as a composition of matter, which is soluble in an aqueous solution of a base before exposure to actinic radiation, but which polymerizes on exposure to actinic radiation and becomes insoluble in said aqueous solution, which comprises the condensation product of

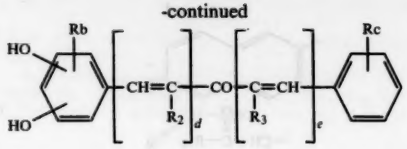
(A) the reaction product of

(1) a phenol of the formula



or

-continued



where

each R represents a halogen atom, an alkyl, cycloalkyl, alkenyl or alkoxy group of 1 to 9 carbon atoms or a nitro group,

each a represents zero or an integer of 1 to 4,

each b represents zero or an integer of 1 to 3,

each c represents zero or an integer of 1 to 5,

R^2 and R^3 individually are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

d and e are each zero, 1, or 2, with proviso that they are not both zero, and

(2) a glycidyl ester selected from the group consisting of the polyglycidyl esters of alkanedioic acids of 5 to 10 carbon atoms, of dimerised linoleic acid, of trimerised linoleic acid, of tetrahydrophthalic acid, of 4-methyltetrahydrophthalic acid, of hexahydrophthalic acid, of 4-methylhexanydrophthalic acid, of phthalic acid, or isophthalic acid, of terephtnalic acid, of polyacrylic acid and of polymethacrylic acid; the copolymer of styrene with glycidyl acrylate, the copolymer of styrene with glycidyl methacrylate, the copolymer of methyl methacrylate with glycidyl acrylate, the copolymer of methyl methacrylate with glycidyl methacrylate, glycidyl acrylate, glycidyl methacrylate, glycidyl 3-(styryl)-acrylate, glycidyl 3-(2-furyl)acrylate, glycidyl 3-(2-pyridyl)acrylate, glycidyl 3-(3-pyridyl)acrylate, glycidyl cinnamate and glycidyl sorbate,

said phenol (1) and glycidyl ester (2) being reacted at a temperature of 80° to 150° C. in the presence of an inert solvent. a free-radical polymerization inhibitor and a ring opening catalyst selected from the group consisting of a tertiary amine and a quaternary ammonium compound, and in a ratio of from 0.75 to 1.25 phenolic hydroxyl equivalents per each 1,2-epoxide group in the epoxy coreactant, with

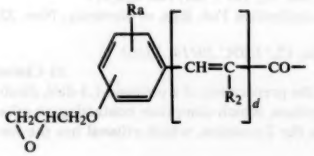
(B) a dianhydride selected from the group consisting of benzophenone-3,3',4,4'-tetracarboxylic acid dianhydride, pyromellitic acid dianhydride and naphthalene-2,3,5,6,7-tetracarboxylic acid dianhydride.

said reaction product (A) and the dianhydride (B) being reacted at a temperature of 80°–150° C. in an inert solvent and with a tertiary amine esterification catalyst, and in a ratio of 0.7 to 1.2 carboxylic acid anhydride equivalents of the anhydride for each hydroxyl group of product (A).

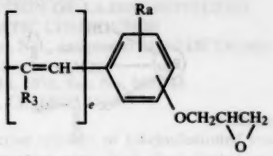
10. An ester as a composition of matter, which is soluble in an aqueous solution of a base before exposure to actinic radiation, but which polymerizes on exposure to actinic radiation and becomes insoluble in said aqueous solution, which comprises the condensation product of

(A) the reaction product of

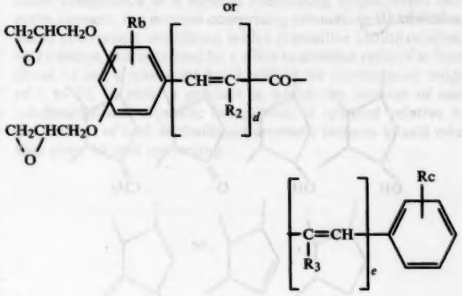
(1) a glycidyl ether of the formula



-continued



or



where

each R represents a halogen atom, an alkyl, cycloalkyl, alkenyl or alkoxy group of 1 to 9 carbon atoms or a nitro group,

each a represents zero or an integer of 1 to 4,

each b represents zero or an integer of 1 to 3,

each c represents zero or an integer of 1 to 5,

R^2 and R^3 individually are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or phenyl group, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

d and e are each zero, 1, or 2, with the proviso that they are not both zero, and

(2) an acid selected from the group consisting of acrylic acid, methacrylic acid, 3-styrylacrylic acid, 3-(2-furyl)-acrylic acid 3-(2-pyridyl)acrylic acid, 3-(3-pyridyl)acrylic acid, cinnamic acid and sorbic acid,

said glycidyl ether (1) and acid (2) being reacted at a temperature of 80° to 150° C. in the presence of an inert solvent, a free-radical polymerization inhibitor and a ring opening catalyst selected from the group consisting of a tertiary amine and a quaternary ammonium compound, and in a ratio of from 0.75 to 1.25 acid equivalents per each 1,2-epoxide group in the epoxy coreactant, with

(B) a dianhydride selected from the group consisting of benzophenone-3,3'4,4'-tetracarboxylic acid dianhydride, pyromellitic acid dianhydride and naphthalene-2,3,6,7-tetracarboxylic acid dianhydride,

said reaction product (A) and the dianhydride (B) being reacted at a temperature of 80–150°C in an inert solvent and with a tertiary amine esterification catalyst, and in a ratio of 0.7 to 1.2 carboxylic acid anhydride equivalents of the anhydride for each hydroxyl group of product (A).

4,181,808

5-KETO PROSTAGLANDIN Fα ANALOGS

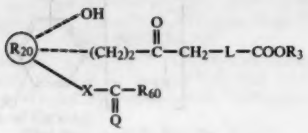
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,898

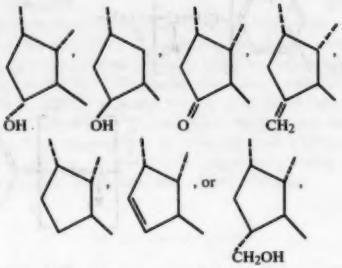
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—121 **20 Claims**

1. A compound of the formula



wherein R_{20} is



wherein L is

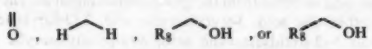
(1) $-(CH_2)d\text{-}C(R_2)_2-$

(2) $-O-CH_2-Y-$ or

(3) $-CH=CH-$

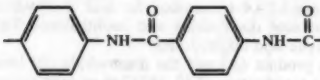
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$, or $-(CH_2)_2-$,

wherein Q is

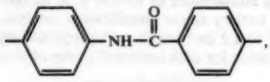


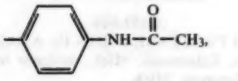
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

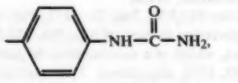
(g)

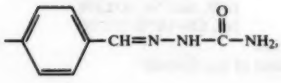


(h)



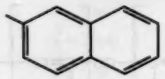




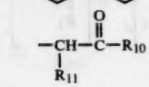


-continued

(l)



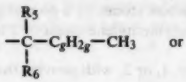
(m)



wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation,

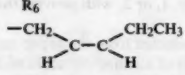
wherein R_{60} is

(1)



or

(2)



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro,

wherein X is

(1) trans-CH=CH—

(2) cis-CH=CH—

(3) $-C\equiv C-$ or

(4) $-CH_2CH_2-$, and

wherein wavy line (~) indicates attachment in alpha or beta configuration.

4,181,809

PRODUCTION OF TERTIARY-BUTYL METHYL ETHER

Norbert F. Cywinski, Odessa, Tex., assignor to El Paso Products Company, Tex.

Filed Oct. 31, 1978, Ser. No. 956,027

Int. Cl.[2] **C07C** *41/00, 41/06*

U.S. Cl. 568—671 **6 Claims**

1. A process for producing tertiary-butyl methyl ether which comprises contacting a mixture of isobutylene and synthesis gas with a methanol synthesis catalyst at a temperature between about 200° C. and 400° C. and a pressure between about 100 and 5000 psi.

4,181,810

PROCESS FOR THE PREPARATION OF PROPANE-1,3-DIOLS, DISUBSTITUTED IN THE 2-POSITION

Otto Immel, Krefeld; Hans-Helmut Schwarz, Krefeld-Traar, and Oskar Weissel, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

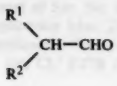
Filed Nov. 16, 1977, Ser. No. 852,117

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653096

Int. Cl.[2] **C07C** *29/14, 35/02*

U.S. Cl. 568—807 **11 Claims**

1. A process for the preparation of a propane-1,3-diol, disubstituted in the 2-position, which comprises contacting an ethanal disubstituted in the 2-position, which ethanal has the formula



(I)

wherein R^1 and R^2 are identical or different and denote optionally substituted alkyl, cycloalkyl, aralkyl or aryl radicals or an optionally substituted heterocyclic radical, or together denote an optionally substituted divalent hydrocarbon radical at 20° to 100° C. for ten minutes to six hours with formaldehyde in the presence of an acid ion exchanger and thereafter contacting the resultant reaction product with hydrogen under hydrogenation conditions.

4,181,811

SELECTIVE REACTION OF 1,4-DISUBSTITUTED AROMATIC COMPOUNDS

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,744

Int. Cl.[2] C07C *15/08*

U.S. Cl. 585—486 **60 Claims**

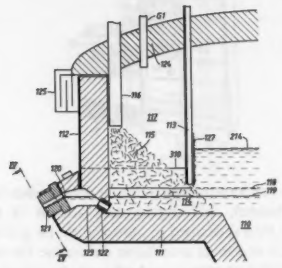
1. A process for selective reaction of 1,4-disubstituted aromatic compounds in a mixture comprising disubstituted aromatic isomers, the process comprising contacting said mixture, under conversion conditions, with a crystalline zeolite catalyst, said catalyst characterized by a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, to yield a product in which the content of said 1,4-disubstituted aromatic compounds is reduced relative to the content of said disubstituted aromatic isomers in said mixture prior to said contacting.

4,181,812

IRON OXIDE MELT REDUCTION FURNACE AND METHOD

Per H. Collin, Falun, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Continuation-in-part of Ser. No. 816,217, Jul. 15, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,246
Claims priority, application Sweden, Mar. 28, 1977, 7703568
Int. Cl.[2] F27B *14/00*
U.S. Cl. 13—35 **2 Claims**



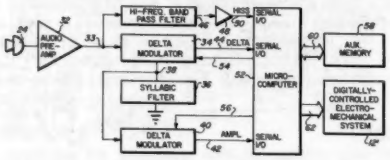
1. An iron oxide melt-reduction furnace comprising a hearth having a raised periphery forming an annular substantially flat and horizontal shelf, said hearth being adapted to hold an iron melt containing carbon up to a level forming a layer on said shelf which is shallow as compared to the melt depth inside of said shelf; a furnace side wall extending upwardly from the outer periphery of said shelf; means for feeding material containing iron oxide to said melt at a location inside of said shelf for reduction by the melt's said carbon; means for heating said melt; and means for feeding pieces of solid steel having a lower carbon content than said melt to said shallow melt layer on said shelf so as to maintain on the shelf an annular pile of the pieces with the pile supported by the shelf and sloping downwardly from said wall to substantially the inner periphery of said shelf, and in which said furnace has a roof from which an annular water-cooled wall depends with a lower end spaced above said shelf at least adjacent to its inner periphery so as to hold back at least some of any slag floating on said melt, said roof and side wall and water-cooled wall forming a substantially gas-tight annular chamber and said furnace having means for introducing pressurized gas to said chamber.

4,181,813

SYSTEM AND METHOD FOR SPEECH RECOGNITION

John Marley, 8715 E. Mackenzie Dr., Scottsdale, Ariz. 85251

Filed May 8, 1978, Ser. No. 903,697
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SE **34 Claims**



1. A method for producing a signal representing a phoneme sound contained in a stream of voice signals, said method comprising the steps of:

(a) producing a first sequence of analog speech signals representing said voice signals;

(b) delta modulating said first sequence of analog speech signals to produce a sequence of digital pulses representing phonemic information contained in said analog speech signals;

(c) operating upon said sequence of digital pulses to detect major slope transitions of said analog speech signals;

(d) measuring time intervals between predetermined ones of said detected major slope transitions;

(e) computing a plurality of speech waveform characteristic ratios between predetermined ones of said time intervals;

(f) comparing said speech waveform characteristic ratios with a plurality of stored phoneme ratios to determine if said speech waveform characteristic ratios match any of said stored phoneme characteristic ratios; and

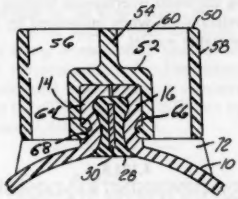
(g) producing a signal representing a phoneme sound corresponding to a matching one of said phoneme characteristic ratios.

4,181,814

SPLICE CASE WITH GASKET AND CLOSURE MECHANISM THEREFOR

Donald J. Smith, Woodland Hills, Calif., assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Aug. 3, 1977, Ser. No. 821,568
Int. Cl.[2] H02G *15/18*
U.S. Cl. 174—92 **13 Claims**



1. A gasket for a substantially cylindrical case having a longitudinally split, tubular closure member and cylindrical end members positionable within the tubular closure member, said gasket comprising

an elongate, resilient sealing element sized to fit in interference within the longitudinal split of the tubular closure member when assembled;

an elongate rigid bar extending longitudinally through said sealing element to provide structural rigidity to said sealing element; and

elongate, resilient sealing rods integral with said elongate sealing element adjacent either end of said elongate sealing element and extending transversely thereto, each said sealing rod including a first surface extending continuously along said sealing rod and being flexible to wrap about the cylindrical end member with said first surface in juxtaposition with the perimeter of the cylindrical end member.

4,181,815

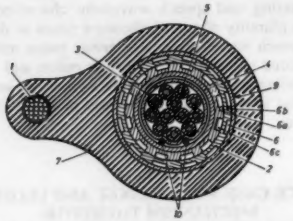
SELF-FLOATING CABLE FOR MARINE OPERATIONS

Bo E. O. Lundberg, Sundbyberg, and Viktor Scuka, Upplands-Vlsby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jul. 12, 1978, Ser. No. 923,680
Claims priority, application Sweden, Jul. 26, 1977, 7708593
Int. Cl.[2] H01B *7/12, 7/18*
U.S. Cl. 174—101.5 **3 Claims**

1. In a self-floating cable with high flexibility, preferably for marine operations, comprising two separate conductor systems of which one transfers energy and the second is load-absorbing, the two conductor systems being surrounded by a common cable mantel and one of the systems being constituted of a number of inner conductors, an inner overlapping friction layer of plastic material with low friction coefficient when

contacting its own surface, a metallic layer lying over said layer, a force absorbing layer lying over said metallic layer and an outer overlapping friction layer of plastic material with low friction coefficient when contacting its own surface lying nearest to the mantel of the cable and over the force absorbing layer, the improvement comprising that the force absorbing



layer includes at least one tube of plastic material which in the longitudinal direction of the cable has a number of circumferentially situated grooves separated by spacer portions, the outer limitation surface of said portions of the utmost lying tube contacting the outer overlapping friction layer in a slipping contact relationship when influenced by external forces on the common cable mantel.

4,181,816

DEVICES FOR COMBINING RANDOM SEQUENCES, USING ONE OR MORE SWITCHING OPERATIONS

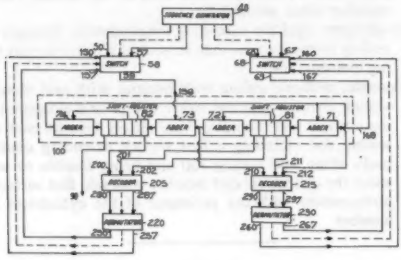
Jean-Pierre Vasseur, Paris, France, assignor to Thomson - CSF, Paris, France

Filed Apr. 3, 1969, Ser. No. 813,100

Claims priority, application France, Apr. 10, 1968, 68.147659

Int. Cl.[2] H04L *9/04*

U.S. Cl. 178—22 **3 Claims**



1. A device comprising: at least one switch having N signal inputs, C control inputs, and N′ outputs for respectively delivering thereto N′ pseudo-random sequences of digits, N, C and N′ being positive integers and N being greater than 1; means for respectively applying to said N signal inputs the successive digits of N sequences respectively associated with said N signal inputs; and a control system, having C outputs respectively connected to said C control inputs, for respectively delivering thereto C control signals for each group of N digits simultaneously applied to said N signal inputs, said control system having at least one input connected to one of said N′ outputs for receiving therefrom successive input digits, and including delaying means for delaying the action of said input digits of said control system on said control signals.

4,181,817

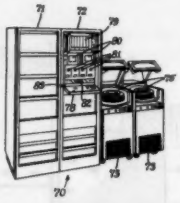
HIGH BIT RATE DIGITAL DATA SIGNAL TRANSMISSION SYSTEM

Luigi C. Gallo, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 28, 1977, Ser. No. 763,762

Int. Cl.[2] H04L *1/00*

U.S. Cl. 178—68 **7 Claims**



1. Apparatus for transmitting a digital data stream through a transmission channel, said digital data stream of the type wherein digital data is defined in consecutive bit cell intervals of certain length and level transitions determine the data content of said digital data stream, and wherein degradation of the transitions can occur upon transmission of the digital data stream through said transmission channel because of differing transmission channel responsive characteristics with respect to level transistions of opposite directions between two signal state levels, comprising:

means for generating a pair of coincident pulses in response to the occurrence of each level transition condition within said digital data stream, said coincident pulses of a duration substantially shorter than said bit cell interval;

means for applying each of the coincident pulses to a separate line for transmission therethrough; and

means connected to said separate lines for receiving transmitted coincident pulses and responsively producing a level transition on a single output line in response to the instantaneous levels on both of said separate lines reaching a selected magnitude.

4,181,818

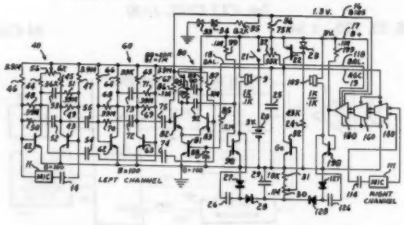
PERSONAL AMPLIFIER SYSTEM

Richard S. Shenier, Forest Hills, N.Y., assignor to Gentex Corporation, Carbondale, Pa.

Filed Nov. 5, 1976, Ser. No. 739,270

Int. Cl.[2] H04M *1/19*

U.S. Cl. 179—1 P **12 Claims**

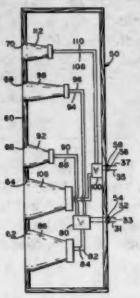


1. A personal amplifier system including in combination a pair of microphones, a pair of earphones, means including a first variable gain amplifier providing an output for coupling one microphone to one earphone, means including a second variable gain amplifier providing an output for coupling the other microphone to the other earphone, and means selectively responsive to that one of the amplifiers providing the greater output for varying the gains of the first and second amplifiers.

4,181,819
UNITARY PANEL MULTIPLE FREQUENCY RANGE SPEAKER SYSTEM

Kurt B. Cammack, 1024 Southview, Fort Wayne, Ind. 46806

Filed Jul. 12, 1978, Ser. No. 924,043
Int. Cl.[2] H04R 5/02
U.S. Cl. 179—1 GA 6 Claims



1. A speaker system comprising:

a speaker enclosure having a substantially flat panel;

said panel having a plurality of speaker sound transmission areas, each area for receiving in sound transmission relation a sound emitting speaker to direct sound emissions from said areas in a direction substantially transverse to said panel;

means for producing multiple channels each carrying respective electrical signals for transducing to sound waves;

a plurality of speakers being mounted to said panel in sound transmitting relation to respective of said speaker areas;

a plurality of crossover networks;

a first crossover network being coupled between a first channel and a first combination of speakers for transducing electrical signals to sound waves;

a second crossover network being coupled between a second channel and a second combination of speakers for transducing electrical signals to sound waves, said second combination of speakers being different than said first combination;

said first combination of speakers is responsive to a first range of frequencies and said second combination of speakers is responsive to a second range of frequencies different than said first range of frequencies, said first and second ranges of frequencies selectable to enhance respective predetermined sound patterns.

4,181,820
ELECTRIC REVERBERATION APPARATUS

Barry A. Blesser, Raymond, N.H., and Karl-Otto Bilder, Lahr, Fed. Rep. of Germany, assignors to Franz Vertriebsgesellschaft mbH, Kippenheim, Fed. Rep. of Germany

Filed Apr. 21, 1978, Ser. No. 898,889
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719276
Int. Cl.[2] H04R 3/00
U.S. Cl. 179—1 J 9 Claims

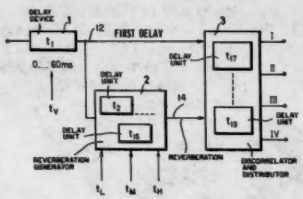
1. Apparatus for producing artificial reverberation of a sound signal, said apparatus comprising:

a delaying device having an input for receiving said sound signal,

a reverberation device connected on the output of the delaying device, for reverberating said sound signal, said reverberation device including several delaying units with different delay times,

an output discorrelator and distributor that is connected to the output of the delaying device as wel as to the output of the reverberation device,

each delaying unit in the reverberation device being connected to a joint input which is connected to the output of the delaying device, each delaying unit being a loop circuit that has a first delay circuit with several tappings, each tapping having a delay time associated with it so that the delay times of the tappings themselves and the sums, differences, and quotients of these delay times have a non-harmonic relationship to one another, each successive



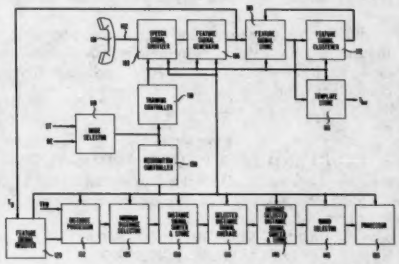
tapping feeding a corresponding damping element whereby the output from each successive tapping is reduced exponentially by its corresponding damping element and coupled to the loop output, and

a second delay circuit with several tappings, said second delay circuit being connected in parallel with said first delay circuit, wherein a delayed and repeated combination of non-reverberated input signals is conveyed from said joint input to the output of the loop circuit by way of said second additional delaying circuit.

4,181,821
MULTIPLE TEMPLATE SPEECH RECOGNITION SYSTEM

Frank C. Pirz, Madison Township, Morris County, and Lawrence R. Rabiner, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1978, Ser. No. 956,438
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SD 26 Claims



1. A circuit for recognizing an unknown utterance as one of a set of reference words comprising means responsive to each of a plurality of utterances of a reference word for generating a set of signals representative of the features of said utterance; means responsive to the feature signal sets of each reference word for generating at least one temple signal, each template signal being representative of a group of said reference word feature signal sets; means responsive to the unknown utterance for generating a set of signals representative of the features of said unknown utterance; means jointly responsive to said unknown utterance feature signal set and each reference word template signal for forming a set of signals each representative of the similarity between said unknown utterance feature signal set and said reference word template signal; characterized in

that selection means (130) are responsive to the similarlity signals for each reference word to select a plurality of said reference word similarity signals; averaging means (135) are adapted to form a signal corresponding to the average of said selected similarlity signals for each reference word; and identifying apparatus (140, 145) is responsive to the average similarity signals for said reference words to identify said unknown utterance as the most similar reference word.

4,181,822

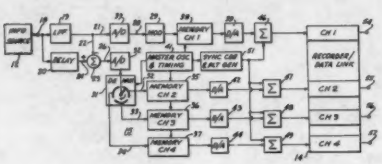
BANDSPLITTER SYSTEMS

Dennis L. Workman, Morgan Hill, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 7, 1978, Ser. No. 884,462

Int. Cl.[2] H04B 1/66; H04N 5/78

U.S. Cl. 179—15.55 R **152 Claims**



1. A method of partitioning a wide-band signal into a plurality of separate narrow-band signals, comprising in combination the steps of:

partitioning the wide-band signal into a low-frequency component and a high-frequency component at least partially above said low-frequency component in the spectrum of said wide-band signal;

translating said low-frequency component into a first narrow-band signal having a band of frequencies at least partially higher than the frequencies of said low-frequency component;

distributing sequential pluralities of elements of said high-frequency component over $(n-1)$ groups, with n being equal to the number of said plurality of separate narrow-band signals;

separately storing each plurality of elements in each group; and

providing separate narrow-band signals in addition to said first narrow-band signal by releasing stored pluralities of elements from said groups in an at least partially time-coincident relationship.

4,181,823

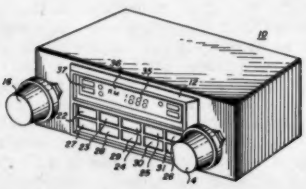
RADIO AND TAPE PLAYER APPARATUS

Murray I. DeLamoreaux, Hoffman Estates, and Paul D. McGee, Medinah, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1978, Ser. No. 946,697

Int. Cl.[2] G11B 1/04, 31/00

U.S. Cl. 179—100.11 **6 Claims**



1. A radio and tape player apparatus comprising:

a frame,

door means pivotally connected to said frame having a closed position for a radio playing mode and an opened position for a tape playing mode,

a plurality of touch control switches arranged on the door means for controlling operation of the radio during the radio playing mode,

said door means and frame including latching means for engagement therebetween during the radio playing mode and which disengage for the tape playing mode,

said latching means having a predetermined latching force sufficient to overcome a force acting on said door means during operation of said switches in the radio playing mode but insufficient to overcome a force acting on said door means upon insertion of a tape during the tape playing mode.

4,181,824

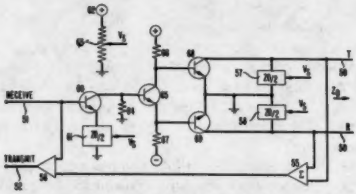
BALANCING IMPEDANCE CIRCUIT

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,576

Int. Cl.[2] H04B 3/40

U.S. Cl. 179—170 D **9 Claims**



1. A hybrid balancing impedance for a telephone cable pair characterized by

a low frequency noninductive resistive-capacitive networkk effective to provide an impedance function inversely proportional to the square root of frequency at low frequencies, and

a high frequency nonreactive resistive network effective to provide a constant impedance function at high frequencies.

4,181,825

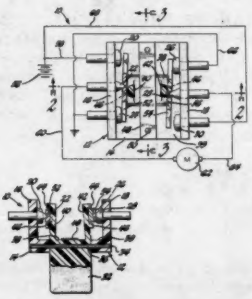
ELECTRIC SWITCH FOR MOTOR REVERSING

Peter C. Epple, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 5, 1978, Ser. No. 912,293

Int. Cl.[2] H01H 9/00, 21/68

U.S. Cl. 200—1 V **2 Claims**



1. An electric switch for use in selectively controlling ener-

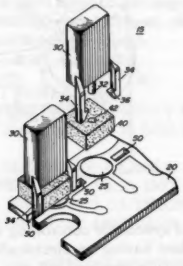
gization of either a first or second electric circuit, said switch comprising a housing having a base member and oppositely disposed side walls, first, second and third terminals carried by each of said side walls, said terminals being spaced from each other and each having a conducting surface facing interiorly of said housing with each of said second terminals being offset in opposite directions from the longitudinal centers of said respective side walls, actuator means pivotally mounted in said base member, resilient means operatively connected to said base member for urging said actuator means into an upright position, retainer means formed on said actuator means and extending interiorly of said housing, first and second contact strips carried by said retainer means and mounted for universal movement with respect to said second terminals so as to normally contact respective opposite first or third terminals, said retainer means being moveable in response to initial movement of said actuator means in either direction so as to selectively cause one of said first and second contact strips to pivot overcenter on said second terminal in a plane normal to said side walls and into engagement with the other of the first or third terminals to provide a conductive path between respective first or third terminals and thereby complete one of said first or second electric circuits, and said retainer means causing said first and second contact strips to pivot in a plane parallel to said side walls and slide across the conducting surfaces of the respective first or third terminals in a cleaning action in response to continued movement of said actuator means.

4,181,826

DOME SWITCH ACTUATING APPARATUS

Leonard Latasiewicz, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1978, Ser. No. 894,054
Int. Cl.² H01H *13/70, 25/04, 3/12*
U.S. Cl. 200—340 **3 Claims**



1. A dome switch actuating apparatus comprising:
a support member having a plurality of slot openings therein;
a switch member having a dome shape mounted on said support member intermediate said openings,
an elongated button actuating member positioned in overlying relation to said switch member,
an elastomeric member positioned intermediate said actuating member and said switch member, said elastomeric member having an aperture formed therein,
said elongated actuating member having a tip portion extending for a predetermined distance along an axis parallel to the longitudinal axis thereof coaxially received within the aperture towards said switch member,

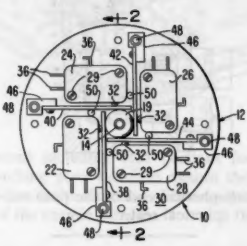
3. Apparatus according to claim 1 wherein said support member has a plurality of switch members and associated actuating members and a housing with openings therein to provide access to said actuating members.

4,181,827

JOY STICK SWITCH

John C. Diepeveen, 1737 Kimberly Dr., Sunnyvale, Calif. 94086

Filed Jul. 21, 1978, Ser. No. 926,789
Int. Cl.² H01H *25/04*
U.S. Cl. 200—6 A **11 Claims**



1. A control device in the nature of a joy stick switch comprising: a base plate having an opening therethrough; a shaft extending through the opening and having a ball joint intermediate its ends for pivotally mounting the shaft on the base plate for movement in any direction throughout a 360° arc from an equilibrium position to an operative position and return; a number of switches secured to the base plate in an array in surrounding relationship to said opening, each switch having an actuator element shiftably mounted thereon for actuating the same; a rigid strip for each switch, respectively, each strip being pivotally mounted on said base plate for movement in a limited distance in opposed directions to shift the actuator element of the corresponding switch as a function of the pivotal movement of the shaft away from said equilibrium position relative to the base plate in a predetermined direction; a stop for each strip, respectively, the stops being secured to and extending laterally from the base plate; and means biasing each strip against the corresponding stop.

4,181,828

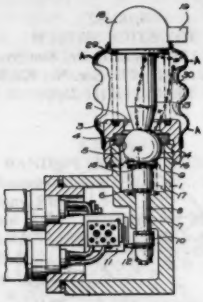
SAFETY CUT-OUT DEVICES

Dennis A. Perry, and Roger H. Creasey, both of Sheffield, England, assignors to Hayden Nilos Conflow Limited, Sheffield, England

Filed Dec. 3, 1976, Ser. No. 747,178
Claims priority, application United Kingdom, Dec. 6, 1975, 50155/75
Int. Cl.² H01H *3/00*
U.S. Cl. 200—18 **9 Claims**

1. A safety cut-out device comprising a housing having an opening formed therein, said housing being provided with a part spherical seat adjacent to the opening and facing inwardly of the housing, an abutment located within the housing and extending generally parallel to the part spherical seat, a bore extending through the abutment coaxial with the part-spherical seat, a plunger slidable in the bore in the abutment and having a flange at one end thereof located within the space between the abutment and the part spherical seat, a control device engageable with the other end of the plunger and operable when the plunger moves axially, a push-rod protruding through the opening and having a part-spherical end mating with the part-spherical seat to allow movement of the push rod in any direction, said part-spherical end having a first flat surface for normally contacting a second flat surface on the adjacent end of the plunger and upon axial movement of the push-rod or rocking of its part-spherical end in the part-spherical seat for sliding the plunger to actuate the control device,

and a coil compression spring encircling the plunger between the abutment and the flange to normally urge the plunger



against the part-spherical end of the push-rod and the latter against the part spherical seat.

4,181,829

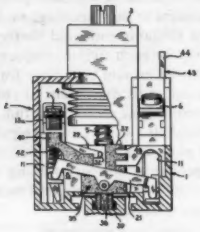
TIME DELAY SWITCH ACTUATING MECHANISM

George J. Selas, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 12, 1978, Ser. No. 895,729

Int. Cl.[2] H01H *43/00*

U.S. Cl. 200—33 R **8 Claims**



5. In a time delay switch mechanism having a timer with an output member that is advanced from a retract position at a preselected rate of travel to perform a timing function, the combination comprising:

(a) a hollow, housing base portion having:

(i) a pair of interior surfaces at opposite ends of the base portion,

(ii) a pair of column members, rising from the bottom that are each spaced inward from a respective interior end surface to form a slideway, said column members also being spaced from one another to present a guideway therebetween, and

(iii) a pair of pivot points on opposite sides of said guideway which are medial of said slideways;

(b) a housing cover portion atop said base portion mounting said timer with the output member thereof disposed above said guideway to advance thereto and retract therefrom, and also mounting stationary contacts that are disposed above said slideways;

(c) a pair of movable contact carriers, each in one of said slideways for a linear, sliding, reciprocal motion, and each carrying a movable contact for engagement and disengagement with stationary contacts above the associated slideway, said carriers also each having a spring cage adapted to hold a load spring;

(d) a rocker arm in the form of an open centered frame in said housing base portion that surrounds said columns and the guideway therebetween which has side members pivoted medial their ends to said pivot points for rocking movement, and that has crosswise portions in lost motion connections with said contact carriers for translation of a circular frame motion to straight line carrier motion;

(e) a latch member carried by said open centered frame;

(f) a pivoted catch having an operating finger extending into the path of advance of said timer output member to be struck and moved thereby, and adapted to engage said latch member to restrain said frame and said contact carriers from movement until pivoted movement of said catch releases said latch member;

(g) a bias spring acting upon said catch to urge said catch operating finger toward said timer output member and to urge said catch into engagement with said latch member;

(h) coupling means having;

(i) a body portion in said guideway for guided, sliding movement with respect to said columns and adapted to be reciprocated by a source of motion,

(ii) a spring loading arm extending into one of said spring cages of said movable contact carriers, and

(iii) means for restraining said timer output member when said coupling means is in one position of reciprocation, and which retreats from said output member upon said coupling means being moved away from said position of reciprocation; and

(i) a load spring in said one of said spring cages interposed between said spring loading arm portion and the contact carrier to be compressed by motion of said arm to urge movement of the contact carrier, the rocker arm and the other contact carrier.

4,181,830

FLIGHT CONTROL SYSTEM FOR FREE FLIGHT MODEL AEROPLANES

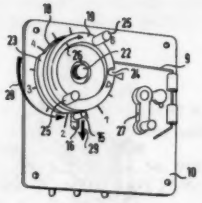
Hermann Neuhierl, Waldstrasse 36, D-8510 Fürth, Bayern, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,467

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618921

Int. Cl.[2] H01H *7/00, 43/00*; A63H *29/02*

U.S. Cl. 200—35 H **6 Claims**



1. A control system for controlling the flight of a free flight model aeroplane having an electrically powdered drive unit and a mechanically operated tail unit including a thermal air current brake, and a time switch means for releasing the thermal air current brake and for interrupting the supply of power to said drive unit, the improvement in the time switch means comprising time delay actuating means having a spring mechanism, means for winding up the spring mechanism, the spring mechanism including a shaft rotatably mounted in the time switch means, a control disc means provided on said shaft for rotation therewith, a peripheral recess provided on said control disc means and a cam surface provided on said control disc means, the peripheral recess being associated with an engageable with one arm of a two arm release lever pivotally mounted in the control system such that when engaged by said one arm and rotated through a prescribed angle, said one arm will be released to undergo pivoting motion, the other arm of the release lever being connectable through tensioning means to

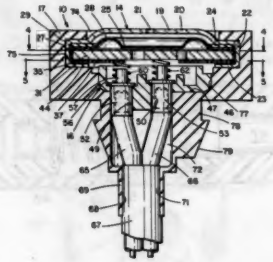
the tail unit of the aeroplane such that said pivoting motion causes actuation of the thermal air current brake, and the control disc means having cam surface controlling switch means for supply of powder to the drive unit.

4,181,831

TIRE DEFLATION MONITOR

William R. Mayer, Rochester, and Lawrence E. Rieth, Springfield, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Jun. 22, 1977, Ser. No. 809,141
Int. Cl.[2] H01H *35/00*
U.S. Cl. 200—61.25 **5 Claims**



1. A pressure switch, comprising; a retainer having a pressure sensing chamber therein, a single fluid impervious circular substantially rigid electrical conducting metal diaphragm therein, said diaphragm being springless and secured to the retainer around the periphery of the diaphragm, an electrical substantially flat conducting base member spaced a small distance from the diaphragm and insulated therefrom, said conducting member having a curved slot therein, defining a tab that is adjustable toward and away from the diaphragm to determine the set point of the switch, first terminal means permanently connected to the diaphragm and second terminal means connected to the conducting base member whereby when sufficient pressure is applied to the retainer chamber the diaphragm will move the small distance into engagement with the conducting base member completing an electric circuit path between the first and second terminals.

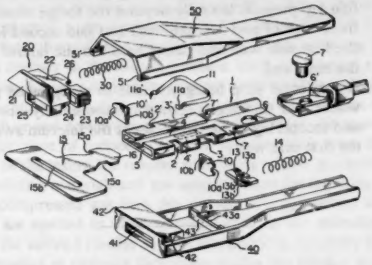
4,181,832

BUCKLE APPARATUS FOR SAFETY BELT

Takeo Ueda, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 886,052
Claims priority, application Japan, Apr. 4, 1977, 52/40987[U]; May 6, 1977, 52/51219; Nov. 9, 1977, 52/150329[U]
Int. Cl.[2] H01H *3/16*; A44B *11/26*
U.S. Cl. 200—61.58 B **11 Claims**

1. A buckle apparatus for safety belt assembly, comprising:
a tongue member having notches on opposite side edges;
a base plate member having a portion of substantially rectangular C-shaped cross section for insertion of the tongue member, and being formed on opposite sides thereof with guide grooves each having supporting surfaces substantially perpendicular to the direction of tongue insertion;
a pair of tongue latching plate members each having a flat surface and being slidable along the respective guide grooves of the base member in a direction substantially perpendicular to the direction of tongue insertion;
biasing means for resiliently urging the tongue latching plate members so that the tongue latching plate members may engage the respective notches of the tongue member and be supported at their said flat surfaces by said supporting surfaces of the guide grooves, when the tongue member is inserted into the base member, to latch the tongue member; and



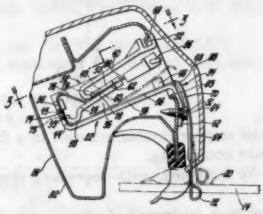
operable means including cam portions for moving the tongue latching plate members against the force of said biasing means in the direction of disengagement from said notches of the tongue member.

4,181,833

CLOSURE ELECTRICAL CONTACT ASSEMBLY

Richard J. Cumming, Warren, and Warren R. Stephenson, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 7, 1978, Ser. No. 913,456
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.62 **3 Claims**



1. A contact assembly for making an electrical connection to a contact plate carried by a movable closure panel when the closure panel is in the closed position comprising:
a housing of dielectric material and a generally flat conductor strip stamped and bent to shape,
said housing having a generally rectangular base having longitudinal edges, a front edge and a rear edge,
a first upright side wall connected to a one longitudinal edge of the base,
a second upright side wall connected to the opposite longitudinal edge of the base,
a transverse tab which is part way up on the first side wall adjacent its front edge and which extends toward said second side wall,
flange means at the front edge of each said side walls extending laterally outwardly away from each other,
an upright lateral wall adjacent the rear edge of the base,
an upright internal wall forming a narrow mounting slot in conjunction with the lateral wall and a fulcrum spaced from a rearward portion of the first side wall by a small gap,
said conductor strip having first and second elongated legs connected at a bend, said first leg having a longitudinal stiffening rib and a rounded nose at the end thereof remote from the bend,
said second leg having a transverse tab at the end thereof remote from said bend which is securely mounted in the

narrow slot formed by the lateral wall and the internal wall of the housing,

said conductor strip having a disengaged position where said first leg projects laterally beyond the flange means at the front edge of said first side wall and said second leg abuts the first side wall and passes between the lateral tab and the base, and

said conductor strip being movable to a depressed position where said first leg is retracted substantially linearly by said second leg being flexed about the fulcrum away from the first side wall.

4,181,834

PEDAL STOPPER PARKING BRAKE SWITCH

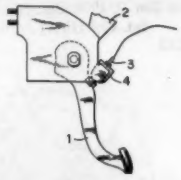
Masaru Kyonomine, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 15, 1977, Ser. No. 851,720

Claims priority, application Japan, Nov. 16, 1976, 51-153741[U]

Int. Cl.[2] H01H *3/14*

U.S. Cl. 200—61.89 **4 Claims**



1. A pedal stopper mechanism used in a footdepress type parking brake comprising:

a pedal for actuating, with depressing thereof, a parking brake;

a pedal stopper, composed of a body portion having a rectangular shape and a U-shaped curvature portion, both being in a cross section and being integrally formed of a resilient material, said body portion being attached to a mounting bracket, which is extended from a parking bracket, for retaining said body portion, said U-shaped curvature portion having in a hollow portion formed therein a projection protruding toward the inner surface of said body portion, whereby said U-shaped curvature portion is normally deformed compressively by the urging action of said pedal as far as the tip portion of said projection comes in abutment on said body portion so as to restrict a further proceeding of said urging action of said pedal, and, when said pedal is depressed to be moved in a reversed direction of said urging action by the depress of said pedal, can be restored to the original U-shape due to the elasticity of the resilient material which forms said U-shaped curvature portion; and

a parking switch disposed within said body portion of said pedal stopper and so constructed as to be actuated by the reciprocation of an actuator, said actuator piercing through said body portion to protrude into said hollow portion to be confronted with said projection, for being pushed, while said U-shaped curvature portion is being deformed, back into said body portion due to the urging of said projection and, when the urging by said projection is released, protruded into said hollow portion to actuate said parking switch.

4,181,835

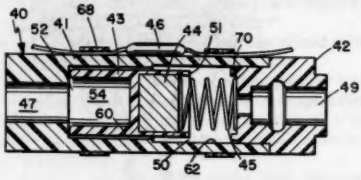
GAS FLOW INDICATOR HAVING A MAGNETIC FIELD SENSITIVE SWITCH THAT IS RESPONSIVE TO THE POSITION OF A MAGNET SECURED TO A PISTON

Gary D. Stadler, 5459 Moonlight La., La Jolla, Calif. 92035; Patrick H. Chambers, 8318 Robbie Way, Lemon Grove, Calif. 92045, and John W. Bowden, 2936 Fairfield St., San Diego, Calif. 92110

Filed Mar. 27, 1978, Ser. No. 890,389

Int. Cl.[2] H01H *35/38*

U.S. Cl. 200—82 E **3 Claims**



1. A gas flow indicator, comprising

a cylinder having an input aperture and an output aperture and defining a generally cylindrical inner chamber between the apertures;

a cylindrical piston constrained within the inner chamber for movement between the input aperture and the output aperture, whereby gas flowing in through the input aperture and out the output aperture goes around the piston and also forces the piston toward the output aperture;

a spring positioned between the piston and the output aperture for forcing the piston away from the output aperture;

a magnet secured to the piston; and

a magnetic field sensitive switch positioned on the outside of the cylinder for being closed by the magnetic field of the magnet upon movement of the piston within the cylinder to a predetermined position dependent upon a predetermined force of gas flow in through the input aperture;

whereby an indication of the state of gas flow through the cylinder may be provided in accordance with whether the switch is open or closed;

wherein the inside diameter of the inner chamber in the region adjacent the input aperture is only slightly larger than the outside diameter of the piston so that gas flowing in through the input aperture forces the piston toward the output aperture end of the inner chamber and flows around and by the outside of the piston in said slightly larger diameter region; and

wherein the inside diameter of the inner chamber in the region adjacent the output aperture is substantially larger than the outside diameter of the piston, with the transition in the size of the diameter of the inner chamber being defined by a step adjacent a position occupied by the piston notwithstanding how close the piston is to the output aperture, to thereby decrease the rate at which the piston is moved toward the output aperture in response to the flow of the gas as the rate of gas flow is increased while maintaining continued movement of the piston toward the output aperture, and to thereby damp variations in piston movement at the endpoint of a movement of the piston to a position of equilibrium determined by the rate of gas flow.

4,181,836

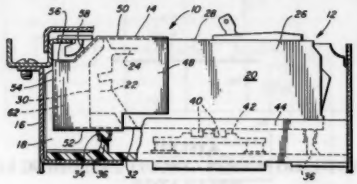
CIRCUIT BREAKER WITH EXTERIOR INSULATING BOOT

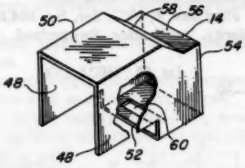
William C. Miracle, Winchester, Ky., assignor to Square D Company, Palatine, Ill.

Filed Dec. 23, 1977, Ser. No. 863,644

Int. Cl.[2] H01H *9/34*

U.S. Cl. 200—144 R **10 Claims**





1. In combination with a circuit breaker having a housing with a passage through which ionized gas passes in response to the tripping of said breaker, the improvement comprising:

an electrically nonconductive member having an integrally formed peripheral wall nestingly receiving a portion of said breaker housing in encircling relationship to said breaker housing,

a member back wall of electrically nonconductive material integrally formed on said member,

and means integrally formed on said nonconductive member detachably attaching said member to said breaker with the back wall of said member spaced from said passage to form an expansion chamber for ionized gas passing through said passage and for preventing said gas from engaging a metal member adjacent said housing.

4,181,837

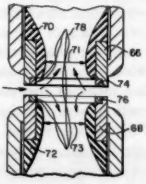
COMPRESSED-GAS CIRCUIT INTERRUPTER HAVING INSULATED CONTACTS

Thomas E. Browne, Jr., Forest Hills Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 723,280, Sep. 15, 1976, abandoned. This application Mar. 9, 1978, Ser. No. 884,886

Int. Cl.[2] H01H *33/02*

U.S. Cl. 200—148 R **9 Claims**



1. A compressed-gas circuit interrupter comprising a first pair of separable contacts, operating means for moving the contacts between open and closed positions, each contact being tubular and having an electrically conducting insert comprised of arc erosion-resistant material at the upstream open end thereof, a tubular electrically insulating liner on the inner surface thereof, the inserts of both contacts being in electrical contact in the closed position, each liner being recessed from the open end of the contact to provide an unlined tubular surface end portion, each liner having a tubular zone of reduced diameter downstream of the gas flow from said insert, the tubular zone of reduced diameter being smaller than the diameter of the insert, the tubular zone being within an electrically insulating material, and gas supply means for directing a flow of compressed gas into the tubular contacts when the contacts are opened to effect elongation of an arc extending between the unlined tubular surface end portions, whereby the arc is extended in opposite directions within the tubular insulating liners.

4,181,838

ACTUATING MECHANISM WITH AN AUXILIARY SWITCH FOR AN ELECTRICALLY LOCKABLE POWER SWITCH

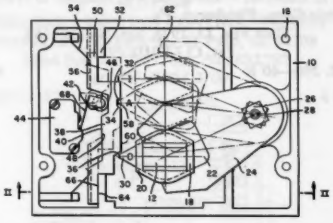
Johannes Neuser, Netphen, and Helmut Menzel, Kreuztal-Ferndorf, both of Fed. Rep. of Germany, assignors to Hundt & Weber Schalgerate GmbH, Freudenberg, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 895,830

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717114

Int. Cl.[2] H01H *3/00, 3/20*

U.S. Cl. 200—153 LA **13 Claims**

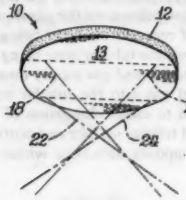


1. An actuating mechanism for an electrically lockable power switch and, more especially, a mechanism with a switching lever which has three switching positions, namely a switch-on position, a switch-off position and a release or tripping position which lies between them, the mechanism being characterized by the incorporation of a sliding cam (**38**) which is retained by a slide bearing (**64**) and which can be put into operative engagement, via a number of stop faces (**32, 34, 36**) with a nose (**30**) which is moved by a switch-actuating mechanism (**12**), as a result of which the sliding cam (**38**) can be moved by the nose (**30**) away from the slide bearing (**64**) against the force of a spring (**54**) such that a change in the operative engagement of the nose (**30**) takes place according to the position of the sliding cam (**38**) and the nose (**30**) and the direction of motion of the switch-actuating mechanism (**12**), and an auxiliary switch (**44**) which lies in the electric locking circuit and which is actuated by a cam face (**40**) of the said sliding cam (**38**).

4,181,839
MULTI-VIEW COLLIMATOR

John Hatton, Northbrook, and Raymond P. Grenier, Mundelein, both of Ill., assignors to Cardiac Medical Sciences Corp., Northbrook, Ill.

Filed Aug. 26, 1977, Ser. No. 827,947
Int. Cl.[2] G03B 41/16; A61B 6/00
U.S. Cl. 250—505 55 Claims

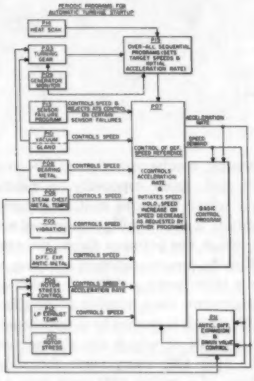


1. A collimator for use in imaging a portion of a body with a camera having a radiation detecting surface, the collimator having mounting means for attachment to said camera adjacent to said radiation detecting surface, and comprising a body of substantially radiation-impervious material defining two or more groups of channels, each group comprising a plurality of channels having axes intersecting a portion of the body being viewed on one side of the collimator and intersecting the radiation detecting surface of the camera on the other side of the collimator, and simultaneously producing a number of different views of said body corresponding respectively to the number of said groups of channels, each axis of each channel lying in a plane approximately perpendicular to the plane of the radiation-detecting surface and all of such planes containing said axes being approximately parallel to each other throughout all of the groups of channels of the collimator when said collimator is mounted to the camera.

4,181,840
ANTICIPATIVE TURBINE CONTROL

Robert L. Osborne, Wallingford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1975, Ser. No. 549,568
Int. Cl.[2] F01D 19/02
U.S. Cl. 290—40 R 49 Claims



1. Apparatus for controlling an electric power generating system, said system including a steam turbine adapted to drive an electric generator, comprising:

(a) means for sensing present values of a select plurality of operating parameters of said turbine;

(b) means, responsive to said present values, for characterizing present heat transfer conditions between the steam and said turbine;

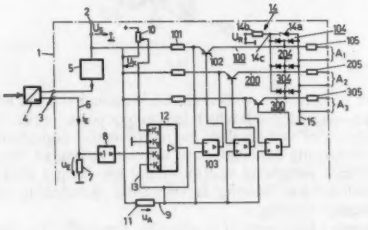
(c) means, responsive to said conditions and to estimates of said select plurality of parameters at at least one predetermined future time, for predicting heat transfer conditions between the steam and said turbine at said future time; and

(d) means for presently controlling the speed and acceleration of said turbine as a function of predicted future heat transfer conditions.

4,181,841
SIGNAL DISTRIBUTION CIRCUIT INCLUDING LOAD REGULATOR

Wolfgang Schaible, Würenlingen, and Hanspeter Senn, Fislisbach, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jun. 6, 1977, Ser. No. 804,059
Claims priority, application Switzerland, Jun. 14, 1976, 7502/76
Int. Cl.[2] H02J 4/00
U.S. Cl. 307—30 5 Claims



1. A circuit arrangement for the distribution of electrical signals, comprising:

means providing a signal input;

means providing a multiplicity of signal outputs;

at least one decoupling circuit for preventing reactive effects between the signal outputs;

said decoupling circuit comprising:

a respective controllable current source including a supply source and having an output circuit provided for each signal output;

a respective resistor of predetermined magnitude arranged in the output circuit of an associated one of the controllable current sources;

a respective null voltage indicator having two inputs and a control output connected with an associated one of the controllable current sources;

one of the two inputs of the null voltage indicator being connected with said signal input means;

the other of said two inputs of the null voltage indicator being connected with the related respective resistor;

the voltage drop across each of the resistors being connected through said other input of the associated null voltage indicator in opposition with the signal input supplied to said one input of the associated null voltage indicator;

a common maximum boundary-potential source provided for said multiplicity of signal outputs; and

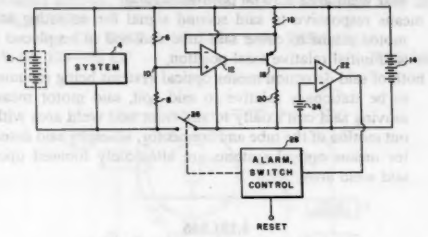
rectifier means for connecting one terminal of each signal output with said common maximum boundary-potential source.

4,181,842

D.C. MONITORING CIRCUIT

Jack Elias, Lansdale, and Theodore B. Bozarth, Perkasie, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 13, 1976, Ser. No. 722,785
Int. Cl.[2] H02J *9/00*
U.S. Cl. 307—66 **6 Claims**



1. A power supply structure for a utilization system comprising

a primary power supply means and a secondary power supply means,

said primary power supply means being connected in energizing relation with said utilization system,

said secondary power supply means being arranged in circuit ground isolation with respect to said primary power supply means,

sampling means for sampling the voltage across said primary power supply means,

a voltage monitoring circuit connected to be energized by said secondary power supply means,

said voltage monitoring circuit including a voltage-to-current converter connected to produce a current signal proportional to the voltage sample provided by said sampling means,

said voltage monitoring circuit further including a current-to-voltage converter connected to produce a voltage signal proportional to said proportional current signal, and

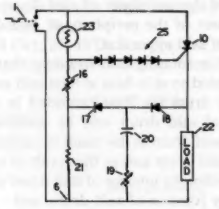
comparator means connected to compare said proportional voltage signal with a fixed reference signal to produce an output signal representative of said comparison.

4,181,843

VARIABLE RESISTANCE TYPE SENSOR CONTROLLED SWITCH

Lonnie G. Johnson, 1463 E. Barkley Dr., Mobile, Ala. 36606

Filed Oct. 5, 1977, Ser. No. 839,631
Int. Cl.[2] H01H *35/00*
U.S. Cl. 307—116 **8 Claims**



3. A condition responsive direct current (DC) half wave switching circuit for controlling the flow of operating power from a source of direct current pulses to a load, said direct current half wave switching circuit comprising:

a. a first switch means for controlling the flow of the direct current pulses, said first switch means being rendered conductive by supplying an increased control voltage to said first switch means, nonconductive states of said first switch means being initiated by an absence of current flow occurring between the DC voltage pulses,

b. a voltage divider means coupled to said first switch means that includes, connected in series, a sensor means, a first variable resistance means and a fixed resistance means, said sensor means detecting the conditions for initiating on states of said first switch means, said variable resistance means determining the impedance of said sensor means at which said first switch means is to become conductive, said voltage divider means supplying control voltage to said first switch means with each direct current voltage pulse,

c. a capacitance means for ensuring continuous conductive states of said first switch means with successive direct current pulses, said capacitance means accumulating a charge by means of current flow from said first switch means during each conductive state of said first switch means and discharging its accumulated charge through said voltage divider means to increase the control voltage supplied to said first switch means with the next successive direct current pulse to return said first switch means to a conductive state,

d. a second switch means for switching said capacitance means between said first switch means and said voltage divider means with the on-off switching of said first switch means,

e. a third switch means for switching control voltage to said first switch means from said voltage divider means to initiate on states of said first switch means,

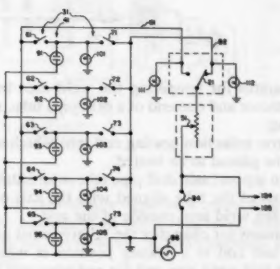
f. a second variable resistance means for selecting a magnitude of change in the impedance of said sensor means in a direction opposite to that initiating a sequence of on states of said first switch means which must be effected before said first switch means is allowed to return to a sustained off state by controlling the magnitude of charge which said capacitance means accumulates and discharges.

4,181,844

THEATRE LIGHTING CONTROL SYSTEM

Jose P. Moretto, 284 W. First St., El Paso, Ill. 61738

Filed Sep. 12, 1977, Ser. No. 832,787
Int. Cl.[2] H02J *3/00*
U.S. Cl. 307—157 **4 Claims**



1. A theatre lighting control system comprising a console including an upper switchboard and a lower patchboard, a plurality of electrical receptacle means, each electrical receptacle means being mounted on said patchboard for receiving male plugs, each receptacle means being coupled to a dimmer switch for controlling intensity of light from theatre lamp circuits and including a plurality of electrical receptacles, a plurality of first sets of switch means being coupled to one of said receptacle means and including a plurality of switches with each switch being coupled to one of said receptacles and

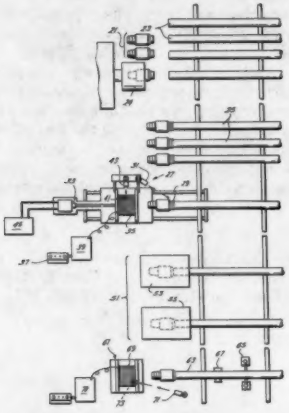
connected in such a manner, as to complete when closed, a circuit to said receptacle, each said receptacle being adapted to receive a male plug at the end of a cable leading to a theatre lamp circuit, a plurality of control switches, each control switch being associated with one of said first sets of switch means and being operable to connect or disconnect said first set of switch means and associated receptacle means to or from an associated dimmer switch, said control switch being a single pole, double throw switch and said lighting system including a plurality of second sets of switch means, each second set of switch means being associated with one of said receptacle means and including a plurality of switches with each switch being coupled to one of said receptacles and connected in such a manner as to complete, when closed, a circuit from said control switch to said associated receptacle, said control switch being operable to connect an associated dimmer switch to one or the other of said first and second sets of switch means which are coupled to and associated with one of said receptacle means.

4,181,845

APPARATUS FOR TEMPERING THE WELD BETWEEN A TOOL JOINT CONNECTOR AND A DRILL PIPE TUBE

Jimmie B. Bolton, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 11, 1977, Ser. No. 814,542
Int. Cl.² H05B 5/04
U.S. Cl. 219—8.5 **2 Claims**



1. Apparatus for tempering the weld area between a tool joint ocnnector and one end of a drill pipe tube, said apparatus comprising:

an electric induction heating coil into which said weld area may be placed to be heated,

means to support said drill pipe tube in an inital position with the axis of the tube aligned with the axis of the coil and with the weld area outside of the coil,

motor means for changing the relative axial position of said tube and coil to a heating position in which the coil is about said weld area and for restoring said initial relative axial position of said tube and coil,

a first infrared radiation responsive detector means for generating a first electric signal in response to infrared radiation of a specified temperature,

said first detector means including an infrared optical system focused to view said weld area of said drill pipe tube when in said initial position,

means responsive to said first signal for actuating said motor means to cause said tube and coil to be placed in said heating position,

said coil having a path for infrared viewing of said weld area from outside of the coil while said coil is about the weld area,

second infrared radiation responsive detector means for generating a second electric signal in response to infrared radiation of a certain temperature,

said second detector means including a second infrared optical system focused through said path on a surface radially inward of the inner periphery of said coil where said weld area may be positioned, and

means responsive to said second signal for actuating said motor means to cause said tube and coil to be placed in said initial relative axial position,

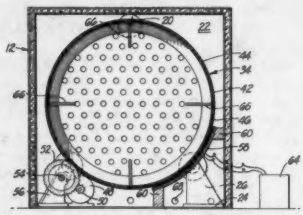
both of said detection means optical systems being mounted to be stationary relative to said coil, said motor means moving said coil axially to and from said weld area without motion of the tube and connector, whereby said detector means optical systems are alternately focused upon said weld area.

4,181,846

ROTARY HEATING APPARATUS

Ronald J. Cunningham, 320 Patrician Way, Pasadena, Calif. 91105

Filed Oct. 5, 1977, Ser. No. 839,334
Int. Cl.² H05B 5/08
U.S. Cl. 219—10.49 A **11 Claims**



1. A rotary heating apparatus which comprises:

a rotary drum having an interior which is adapted to contain material to be heated, at last the periphery of said drum extending completely around the exterior of said drum being formed of a material capable of being heated by magnetic induction,

said drum having a front wall provided with an opening therein, at least a part of said drum being perforate, said drum including lifter means located within the interior of said drum,

support means for rotatably supporting said drum so that said drum may be rotated about its axis,

induction heating coil means located sufficiently close to at least part of the periphery of said drum so as to heat at least said part of the periphery of said drum during the operation of said apparatus,

drive means for rotating said drum so that as said heating coil is operated so as to heat at least said part of the periphery of said drum the heat provided in said part of the periphery of said drum will be distributed within the interior of said drum as the result of radiation and conduction from said drum and as the result of movement of the contents within the interior of said drum which movement is caused by rotation of said drum, and

a substantially air-tight cabinet located around said drum, said support means, said heating coil means, and said drive means, said cabinet having a door located adjacent to said opening in said front wall of said drum, said cabinet having a vent opening for use in conveying heated gas from the interior of said cabinet and having means for introducing air into said cabinet remote from said vent opening.

4,181,847
APPARATUS FOR SYNCHRONIZING THE SPEEDS OF TWO WEBS OF GOODS

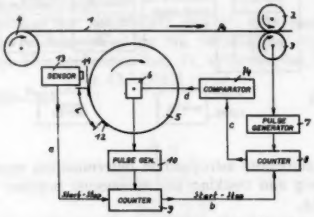
Gerhard Buschmann, Düsseldorf; Karl Thievessen, Hilden; Peter Weiss, Monheim-Baumberg, and Werner Reitter, Neuss-Erfttal, all of Fed. Rep. of Germany, assignors to Jagenberg-Werke Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 19, 1977, Ser. No. 798,737

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623804

Int. Cl.[2] **G06F** *7/38;* **G06G** *7/00;* **B65H** *19/16*

U.S. Cl. 235—92 CC **2 Claims**



1. In a synchronizing system for synchronizing the speeds of two webs of goods, wherein the speed of the first web is adjustable and the speed of the second web is constant and including first means for generating first pulses dependent upon the speed of the first web and a first counter associated with the first web and triggered by the first pulses, the improvement which comprises means for controlling the first counter to continuously count to a desired numerical value comprising at least one pair of timing marks running with the first web and means for detecting the timing marks to start the first counter at the first mark and stop and reset same at the second mark to set same to the counted number defining the desired numerical value, wherein the first pulse generating means effects the first counter to thereafter continuously restart and count to the desired numerical value and restart again; second pulse generating means for generating constant frequency second pulses associated with the constant speed of the second web, a second counter triggered by the second pulses and which is started, reset and restarted by the first counter when the desired numerical value is reached in the first counter to obtain a count in the second counter and means comparing the count in the second counter to a constant value representative of the constant speed of the second web to indicate whether the speed of the first web is greater or lesser than the constant speed of the second web.

4,181,848
ELECTRONIC DIGITAL SCALE WITH A MEMORY

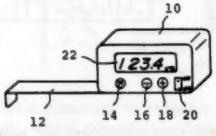
Tetsuo Iwase, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1977, Ser. No. 845,653

Claims priority, application Japan, Oct. 26, 1976, 51-144576[U]

Int. Cl.[2] **G06M** *3/14*

U.S. Cl. 235—92 DN **12 Claims**



1. A small portable electronic digital scale comprising:

an extensible means for extending along an object to be measured;

sensing means for sensing first and second measurement information data representative, respectively, of first and second extended positions of said extensible means;

storing means for storing said first measurement information data;

operating means interconnected with said sensing means and said storing means for arithmetically operating on said first measurement information based upon said second measurement information yielding a result;

said operating means further comprising:

a memory;

an adder;

means responsive to the sensed and stored information for interconnecting said memory and said adder;

indicating means for directing said operating means to perform a calculation on said first and second measurement information thereby providing third measurement information as said results of said calculation in response to actuation of said indicating means;

said interconnecting means further comprising:

first means included within said operating means to gate said first measurement information data from said sensing means into said memory;

second means included within said operating means to gate said first mesurement information from said memory into said adder;

third means included within said operating means to gate said second measurement information data from said sensing means into said adder; and

means for displaying said third measurement information.

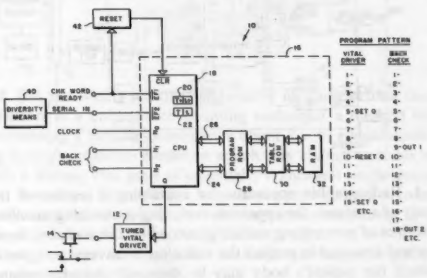
4,181,849
VITAL RELAY DRIVER HAVING CONTROLLED RESPONSE TIME

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,574

Int. Cl.[2] **G07C** *11/00*

U.S. Cl. 235—92 T **6 Claims**



1. A system for providing a signal to a tuned vital driver so as selectively to hold up or sustain a vital relay, which is connected to the driver, for a variety of predetermined time intervals, comprising

means for selectively generating each of the predetermined time intervals, said means including a digital microprocessor having one of its outputs connected to said tuned vital driver, said microprocessor generating a dynamic signal at said one output of fixed frequency and extending for a specified time interval so long as a cycle number is being continually replenished in the microprocessor in response to the presence of a safe condition;

a diversity means connected to the input of said microprocessor for selectively supplying, in response to differing safe conditions, both a respective check word and the complement of said check word as controlling inputs of

said microprocessor for developing the required number of cycles for the dynamic output signal from said processor, whereby a respective time interval is generated during which the vital relay will be sustained;

a pair of registers within said microprocessor for storing a pair of time numbers corresponding to said check word and its complement, said time numbers representing the selected time interval during which the vital relay is to be sustained;

means for continuously and repetitively decrementing the time number values in said registers;

a cycle checking means for continuously and repetitively checking on the programmed operations of said microprocessor.

4,181,850
DATA TRANSMISSION IN RADIOGRAPHIC APPARATUS

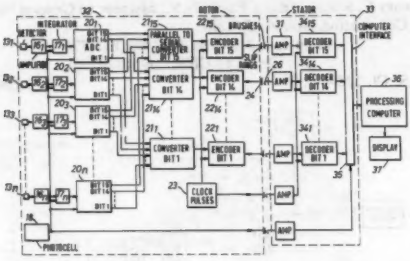
Ian A. Fairbairn, Maidenhead, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 773,760, Mar. 2, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,373

Claims priority, application United Kingdom, Mar. 3, 1976, 8418/76

Int. Cl.² A61B *6/02*; G01N *23/08*

U.S. Cl. 250—445 T **12 Claims**



1. Radiographic apparatus for examining a section of the body of a patient, the apparatus including: a scanning member; a source of penetrating radiation carried by the scanning member and arranged to project the radiation to traverse a region in which the patient's body may be disposed; detector means, sensitive to the radiation, carried by the scanning member and arranged to receive the radiation after it has traversed the region; means for rotating the scanning frame about an axis intersecting the region; a fixed structure supporting the scanning member during motion comprising at least said rotation; a plurality of slip rings fixed in relation to either said scanning member or said fixed structure and a plurality of brushes, at least one brush co-operating with each slip ring, fixed in relation to the other of said scanning member or said fixed structure to form a plurality of channels, a channel comprising at least two slip rings each co-operating with at least one brush, adapted to transmit signals, including data signals from said detectors, to electrical connections on said fixed member during said rotation, and encoder means adapted to encode the data signals according to a code suitable for AC as well as DC transmission.

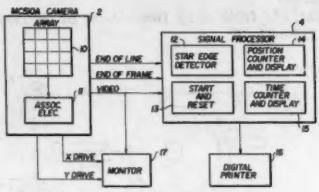
4,181,851
AUTOMATIC ASTROPOSITION DETERMINATION APPARATUS

William A. Allen, Clinton, Md., and Pi-Fuay Chen, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 880,734

Int. Cl.² G01J *1/20*

U.S. Cl. 250—203 R **8 Claims**



1. An automatic astroposition determination apparatus for determining and tracking the astronomic position of a star, comprising,

swivel mounted telescope means for sighting said star and for focussing an image thereof at a focal plane,

a two dimensional rectangular array of photosensors having photosensors disposed in both the x and y directions located at said focal plane, said image of said stars being focussed on said array,

means for electrically scanning said array of photosensors row by row to determine the location of said focussed image on said array in at least one of said x and y directions, said location on said array changing in correspondence with changes in the astroposition of said star,

display means, and

means reponsive to said scanning for causing an indication of the location of said image on said array to be displayed on said display means, and for generating a signal indicative of the row which the leading edge of said star image overlies, said signal generating means further including means: (a) for generating an end of line signal responsive to said means for scanning, (b) for completing the scanning of each row, and (c) for generating a video signal when said means for scanning scans a photosensor which the leading edge of said star image overlies.

4,181,852
SPARK SOURCE SPECTROGRAPHIC ANALYSIS PROCESS AND APPARATUS

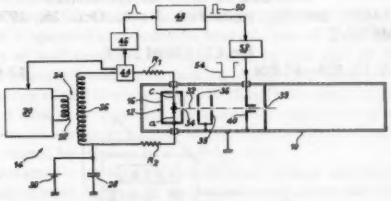
Jacques Berthod, Saint Martin d'Heres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 20, 1977, Ser. No. 789,328

Claims priority, application France, May 3, 1976, 76 13145

Int. Cl.² B01D *59/44*

U.S. Cl. 250—286 **8 Claims**



1. A spark source mass spectrographic analysis process of the type in which ions are produced by means of sparking discharges between two electrodes, the ions produced being directed towards a mass spectrograph where spectrography is

performed, wherein the direction of each discharge is detected, the ions are directed towards the mass spectrograph where they are analysed when the discharge has a desired direction but are deflected away and are not analysed when the discharge does not have said desired direction.

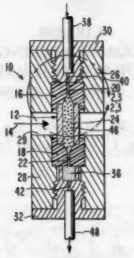
4,181,853
LIQUID CHROMATOGRAPHY SYSTEM WITH PACKED FLOW CELL FOR IMPROVED FLUORESCENCE DETECTION

Ahmad Abu-Shumays, Los Altos, and Edward L. Johnson, Mountain View, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 878,976, Feb. 17, 1978, abandoned, which is a continuation of Ser. No. 748,867, Dec. 10, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,738

Int. Cl.[2] G01N *21/34*

U.S. Cl. 250—304 **21 Claims**



1. A method for enhancing the fluorescent detectability of an aflatoxin present in a solvent, said method comprising the step of passing an aflatoxin-bearing eluant from a liquid chromatography column through a flow cell packed with aflatoxin-adsorbing particles, whereby there is caused a dynamic equilibrium of the aflatoxin between the solvent of the eluant and said particles, and whereby said detectability is enhanced; said flow cell having a wall portion that is substantially transparent to electromagnetic radiation of a frequency that causes the aflatoxin to fluoresce.

4,181,854
METHOD FOR READING THE RADIATION DOSE RECEIVED BY A TSC DOSIMETER

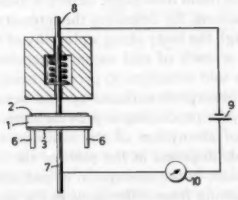
Stefan Westerberg, Nyköping, Sweden, assignor to AB Atomenergi, Nyköping, Sweden

Filed Feb. 9, 1978, Ser. No. 876,557

Claims priority, application Sweden, Feb. 11, 1977, 7701560

Int. Cl.[2] G01T *1/00*

U.S. Cl. 250—336 **3 Claims**



1. A method for determining the radiation dose received by a TSC dosimeter, which comprises a dosimeter body of a dielectric material having two opposed major surfaces at least partially covered by one contact electrode each, said method comprising the steps of connecting the dosimeter through its said contact electrodes to the terminals of an external source of polarizing voltage and to an external closed electric circuit, detecting the initial current pulse then flowing through the dosimeter due to its capacitive properties, determining whether the peak value of said initial capacitive current pulse lies within a predetermined range, initiating a heating of the dosimeter and a measuring and recording of the thermally stimulated currents produced by the heated dosimeter through said external closed electric circuit.

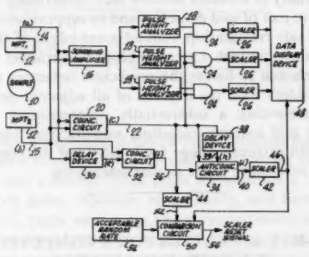
4,181,855
METHOD AND APPARATUS FOR DETERMINING RANDOM COINCIDENCE COUNT RATE IN A SCINTILLATION COUNTER UTILIZING THE COINCIDENCE TECHNIQUE

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 30, 1978, Ser. No. 873,318

Int. Cl.[2] G10T *1/20*

U.S. Cl. 250—363 R **8 Claims**



4. For use with a scintillation counter utilizing at least two detectors in a coincidence counting technique, a method for determining a random coincidence count due to events resulting in single-quantum emissions which may chance to occur in such a manner that pairs of essentially coincident single-quantum events are detected one in each detector and are erroneously counted as radioactive disintegrations occurring in a sample, said method comprising the steps of:

detecting real and apparent coincidences between pulses from the two detectors;

delaying pulses from one of the detectors;

detecting coincidences between the delayed pulses from one detector and undelayed pulses from the other, to obtain a random coincidence pulse train from which an approximate random coincidence count rate can be determined;

delaying the real and apparent coincidences between pulses from the two detectors;

eliminating from the random coincidence pulse train, in an anti-coincidence circuit, those coincidence pulses that occur essentially simultaneously with, and are therefore attributable to, either originally detected real and apparent coincidences, or delayed real and apparent coincidences, to obtain a corrected random coincidence pulse train;

accumulating a count of pulses occurring in the corrected random coincidence pulse train, to obtain a corrected random coincidence count rate.

4,181,856

ARRANGEMENTS FOR DETECTORS OF RADIATION

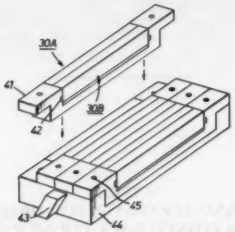
Phillip R. Bone, Hillingdon, England, assignor to EMI Limited, Hayes, United Kingdom

Filed Feb. 27, 1978, Ser. No. 881,814

Claims priority, application United Kingdom, Mar. 24, 1977, 12410/77

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—366 **1 Claim**



1. An arrangement for detecting ionising radiation including a plurality of scintillator crystals, a plurality of photo-diodes, the crystals being secured to, and in direct optical communication with, respective ones of said photo-diodes, to form a plurality of detectors adapted to produce electrical output signals in response to ionising radiation incident on said crystals, a plurality of detector holders each constructed to receive a respective pair of said detectors and to support said detectors in side-by-side relationship with adjacent edges of the respective crystals in contact, a locating block constructed to receive said holders and to locate the respective detectors supported by said holders with the crystals of all adjacent detectors in contact, presenting a substantially uninterrupted receiving surface to said ionising radiation, said locating block being formed with projecting lugs for location of the complete assembly in relation to other similar assemblies.

4,181,857

X-RAY APPARATUS FOR A COMPUTED TOMOGRAPHY SCANNER

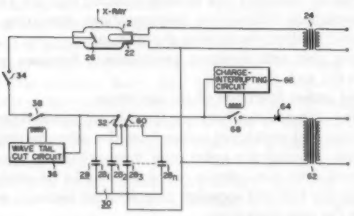
Katsuhiko Miyoshi, Sagamihara, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Sep. 30, 1977, Ser. No. 838,369

Claims priority, application Japan, Sep. 30, 1976, 51/117560

Int. Cl.[2] H05G *1/30*

U.S. Cl. 250—402 **5 Claims**



1. A control circuit for activating an X-ray tube to produce a succession of X-ray emissions of like intensity comprising, in combination:

a plurality of capacitors for supplying high voltage to activate said X-ray tube;

first changeover switch means for sequentially connecting said capacitors with said tube to supply an activating voltage thereto;

a voltage source for supplying a charging voltage;

second changeover switch means for sequentially connecting said voltage source with said capacitors to supply charging voltage to the latter, said first and second changeover switch means being operated in synchronized relation to alternately connect each said capacitor first to said voltage source and then to said tube to supply said tube with a succession of high voltage pulses; and

first voltage supply interrupting means connected in circuit with said X-ray tube and including first voltage sensitive switching means for sensing the voltage supplied through said first changeover switch means and for interrupting said X-ray tube circuit when said voltage drops below a prescribed threshold value.

4,181,858

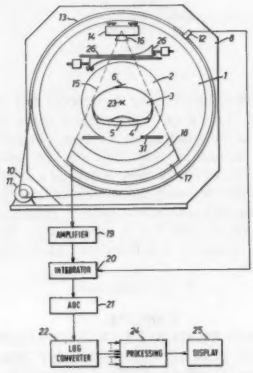
ADJUSTABLE COMPENSATING DEVICE FOR RADIOGRAPHIC APPARATUS

John F. Moore, Lake Bluff, Ill., assignor to EMI Limited, Hayes, England

Filed Dec. 30, 1977, Ser. No. 865,878

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **18 Claims**



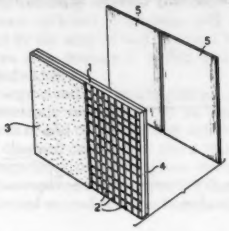
1. Apparatus, for examining a body by means of penetrating radiation, including: source means for irradiating the body with a fan-shaped distribution of radiation projected in a mean direction, means for scanning the source around the body so as to project the radiation through a cross-sectional slice thereof from a plurality of mean directions; detector means, including a plurality of detectors, for detecting the intensity of radiation transmitted through the body along a plurality of beams within said distribution at each of said mean directions, and means cooperating with said detectors to provide beam data signals indicative of the absorption suffered by said beams in passing through said body for processing to provide a representation of the distribution of absorption of the radiation in said slice; attenuating means, disposed in the path of the radiation, for reducing differences, in the absorption of radiation along different beams, resulting from differences in the path lengths of the beam through the body; optical means for investigating the position of the attenuating means relative to the body and for providing control signals indicative of said position; and adjusting means for moving said attenuating means in response to said control signals to attain a predetermined position relative to the body.

4,181,859

RETICLE DEVICE APPLICABLE TO FLEXIBLE RADIOGRAPHIC FILMS

Pier Luigi Vitalini, Via Alassio 30, Turin, Italy

Filed Mar. 29, 1978, Ser. No. 891,352
Claims priority, application Italy, Apr. 8, 1977, 67781 A/77
Int. Cl.[2] H05G *1/28*
U.S. Cl. 250—476 **1 Claim**



1. Reticle device for application to a flexible wrapper having a radiographic film therein for use in dentistry, the device comprising:

a flexible support sheet of dimensions substantially corresponding to those of the radiographic wrapper film;

a measurement reticle printed in radio-opaque material on one side of the support sheet;

a protective layer, insoluble in water and saliva, covering the reticle on said one side of the support sheet;

a self-adhesive layer applied to the opposite side of the support sheet from the reticle, and

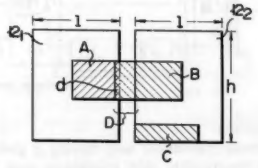
removable cover means of anti-adhesive material applied to the self-adhesive layer whereby upon removal of said cover means said reticle device may be secured to said wrapper by said self-adhesive layer.

4,181,860

RADIANT BEAM EXPOSURE METHOD

Masahiko Sumi, Yokohama, Japan, assignor to Vlsi Technology Research Association, Japan

Filed Jan. 31, 1978, Ser. No. 873,885
Claims priority, application Japan, Jan. 31, 1977, 52-8806
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—492 A **7 Claims**



1. A radiant beam exposure method for depicting a given pattern by a number of scanning lines of a radiant electron beam comprising the steps of:

dividing the given pattern into a number of pattern sections, converting each of the pattern sections into a plurality of pattern information bit trains which correspond to the scanning lines, respectively, and are each provided at least one end with a jointing information bit;

storing into a memory device pattern information corresponding to the given pattern in the form of said pattern information bit trains;

selectively reading out the pattern information stored;

converting the pattern information bit trains of the pattern information read out into a blanking signal; and

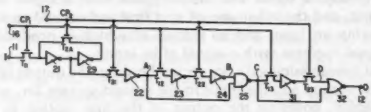
applying the blanking signal into radiant beam emitting means whereby the radiant electron beam is controlled by the blanking signal and a jointing portion corresponding to the jointing information bit is formed at least one end of the pattern section depicted by the electron beam scanning, the jointing portion ensuring jointing between adjacent pattern sections.

4,181,861

NOISE-INHIBITING CIRCUIT RESPONSIVE TO A SIGNAL SUPPLIED ONLY TO THE FIRST STAGE OF THE CIRCUIT

Yukio Maehashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1978, Ser. No. 884,398
Claims priority, application Japan, Mar. 9, 1977, 52/26208
Int. Cl.[2] H03K *1/10*
U.S. Cl. 307—221 C **18 Claims**



1. A circuit comprising: a circuit input terminal for a circuit input signal; a circuit output terminal for a circuit output signal; a first and a second clock input terminal for a first and a second clock pulse sequence, respectively, said first and said second clock pulse sequences being synchronized with each other; a plurality of memory stages of a first type, each having a stage input terminal and a stage output terminal and comprising a transfer gate connected to said stage input terminal, said transfer gate being rendered conductive in response to pulses of said first clock pulse sequence, and a temporary memory connected between said transfer gate and said stage output terminal;

a plurality of memory stages of a second type, each having a stage input terminal and a stage output terminal and comprising a transfer gate connected to said second-type memory stage input terminals, said transfer gate being rendered conductive in response to pulses of said second clock pulse sequence, and a temporary memory connected between said transfer gate and said second-type memory stage output terminals;

coupling means for coupling said first-type and said second-type memory stages in series so that said circuit input signal may be shifted through said series connected first and second type memory stages in synchronism with the pulses of said first and said second clock pulse sequences; comparison means, coupled to predetermined ones of the memory stages of a prescribed one of said first and said second type, for comparing the stage output signals of said predetermined memory stages with one another and for producing a result signal at the time the stage output signals are simultaneously present at the stage output terminals of said predetermined memory stages; and output means responsive to said result signal for supplying said circuit output signal to said circuit output terminal.

4,181,862

HIGH SPEED RESETTABLE DYNAMIC COUNTER

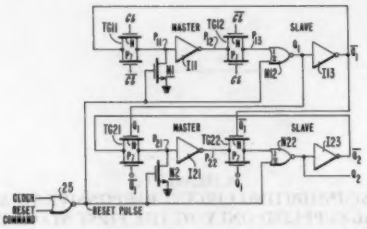
Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,462

Claims priority, application United Kingdom, Sep. 27, 1976, 40027/76

Int. Cl.[2] H03K *23/08, 21/32, 21/36, 3/353*

U.S. Cl. 307—225 C **10 Claims**



1. A counter stage in combination with a source of cyclical signals having a first binary significance during a first portion of the cycle and having a second binary significance during a second portion of the cycle, comprising:

a first section and a second section, one of said first and second sections having an input and an output at which is produced a signal 180° out-of-phase with a signal at its input, and the other one of said first and second sections having an input and an output at which is produced a signal in-phase with a signal at its input;

a first transmission gate connected between the output of the first section and the input to the second section for, when enabled, coupling the output of the first section to the input of the second section;

a second transmission gate connected between the output of the second section and the input of the first section for, when enabled, coupling the output of the second section to the input of the first section;

resetting means coupled to the input of the first section for, when enabled, setting the input of the first section to a predetermined level;

means for continuously applying said cyclical signals to said first and second transmission gates for enabling said first transmission gate and disabling said second transmission gate during said first portion of each cycle, and for enabling said second transmission gate and disabling said first transmission gate during said second portion of each cycle;

a terminal adapted to receive a reset signal; and

gating means responsive to said cyclical signals and to said reset signal for enabling said resetting means only during said first portion of each cycle and when a reset signal is present.

4,181,863

PHOTODIODE CIRCUIT ARRANGEMENTS

John C. Parker, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

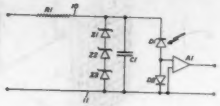
Continuation of Ser. No. 783,688, Apr. 1, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,852

Claims priority, application United Kingdom, Apr. 3, 1976, 13620/76

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—311 **14 Claims**

1. An avalanche photodiode circuit arrangement comprising an avalanche photodiode having a P-N junction within a semiconductor body and being sensitive to incident radiation to which the avalanche photodiode is responsive, the material of the semiconductor body having a positive temperature coefficient of breakdown voltage, means for operatively connecting the photodiode to an electrical supply such that the radiation sensitive P-N junction is reverse biased, said means including voltage limiting means for determining the reverse bias voltage and further means for selectively changing the reverse bias voltage applied across the photodiode between a higher and a lower value, said higher value being equal to an empirically-derived breakdown voltage of the photodiode at a desired operating temperature of the photodiode, and said lower value comprising an empirically-derived required reverse bias voltage at the desired operating temperature when the photodiode is to detect incident radiation, the temperature of the photodiode being stabilized at the desired operating value with the breakdown voltage at this temperature applied across the photodiode, and detection of radiation incident on the photodiode taking place at the lower value of the reverse bias voltage, the detection of the incident radiation taking place with the temperature, at least in the active region associated with the radiation senstive P-N junction of the photodiode, being substantially at the desired operating value.



4,181,864

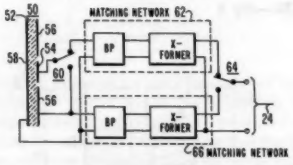
MATCHING NETWORK FOR SWITCHABLE SEGMENTED ULTRASONIC TRANSDUCERS

Karl-Friedrich Etzold, New York, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 917,890

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—314 **2 Claims**



1. In combination:

(a) an ultrasonic transducer unit having a given operating frequency bandwidth, said transducer unit including a piezoelectric medium having a common electrode on one side thereof and segmented first and second electrodes on the other side thereof, a first area of said transducer unit defined by said first electrode and said common electrode exhibiting a first clamped capacitance and first acoustic impedance over said given operating frequency bandwidth and a second area of said transducer unit defined by said second electrode and said common electrode exhibiting a second clamped capacitance and a second acoustic impedance over said given operating bandwidth,

(b) a first matching network effective for matching solely said first acoustic impedance to a predetermined electrical impedance over said given frequency operating band-

width only when said first matching network is coupled therebetween,

(c) a second matching network for matching said first and second acoustic impedances in parallel to said predetermined electrical impedance over said given frequency operating bandwidth only when said second matching network is coupled therebetween, and

(d) switchable coupling means for selectively rendering effective said first matching network, or, alternatively, said second matching network without ever introducing an inductance sufficient to resonate with or total capacitance equal to the sum of said first and second clamped capacitances at a frequency within said operating frequency bandwidth;

wherein said segmented first and second electrodes comprise a center-electrode surrounded by an annular electrode, said first area of said transducer unit exhibiting a relatively small first clamped capacitance and a relatively high first acoustic impedance over said given operating frequency bandwidth compared to the respective sizes of said second capacitance and second acoustic impedance of said second area;

wherein said switchable coupling means includes first coupling means connecting said center electrode solely to one end of said first matching network, second coupling means connecting said annular electrode solely to one end of said second matching network, a low-inductance slidable first switch for selectively bridging said center and annular electrodes, and a double-throw second switch for selectively connecting solely the other end of either the first matching network or alternatively the second matching network to said predetermined electrical impedance, and

wherein said first switch comprises a slidable electrically-conducting member including first and second spaced contacts, said first switch further including means for situating said member so that both said first and second contacts engage said first switch or for alternatively situating said member so that said first contacts engage said center electrode and said second contacts engage said annular electrode in a second switch position of said first switch.

4,181,865

SENSING CIRCUIT FOR A MULTI-LEVEL SIGNAL CHARGE

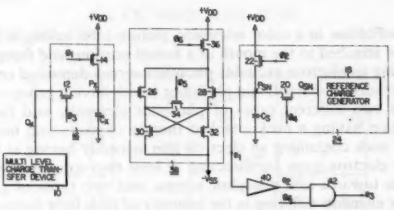
Susumu Kohyama, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 28, 1978, Ser. No. 900,860

Claims priority, application Japan, Apr. 28, 1977, 52-49719

Int. Cl.[2] H03K *5/20;* **G11C** *7/06, 19/28;* **H03K** *3/286*

U.S. Cl. 307—361 **19 Claims**



1. A sensing circuit for a multi-level signal charge, comprising:

means for holding an inspected charge;

means for providing a plurality of reference voltage potentials in sequential orders of magnitude on a time-sequential basis; and

means for comparing an unknown voltage potential corresponding to the inspected charge level present at said inspected charge holding means with each of said plurality of reference voltage potentials, thereby to provide, upon inversion of the relation between magnitudes of the unknown voltage potential and each of the reference voltage potential being compared, a signal based upon the inversion.

4,181,866

PERMANENT MAGNET WITH REDUCED THICKNESS AT THE POLE AREAS FOR SMALL SIZE D-C MOTORS

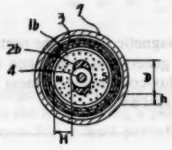
Masanori Morisawa, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1978, Ser. No. 907,115

Claims priority, application Japan, May 26, 1977, 52/61977

Int. Cl.[2] H02K *21/12*

U.S. Cl. 310—154 **6 Claims**



1. A small size d-c motor comprising a resin housing including an end portion having a cylindrical outer periphery and a center portion extending from the end portion to the opposite end of the housing and provided with a bore, a field magnet having an inner periphery surrounding the center portion of the housing and having a generally circular outer periphery, bearings positioned at the ends of the housing and concentric with the bore, a shaft rotatably supported by the bearings, a cup-shaped coreless armature coil secured to the shaft and surrounding the magnet with a space provided therebetween, and a yoke surrounding the armature coil with a space provided therebetween and having one end attached to the outer periphery of the housing, wherein:

the field magnet is made of a magnetic material having a high permeability and is provided with magnetic pole portions and intermediate portions between the pole portions, the inner periphery of the field magnet being formed to provide a greater wall thickness between the inner and outer peripheries at the intermediate portions than at the pole portions.

4,181,867

BRUSHLESS DIRECT-CURRENT MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 706,550, Jul. 21, 1976, abandoned. This application May 26, 1978, Ser. No. 910,005

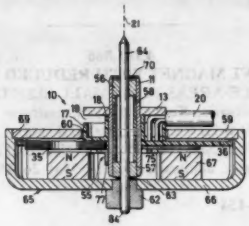
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1975, 2532551; Aug. 8, 1975, 2535411

Int. Cl.[2] H02K *21/12*

U.S. Cl. 310—156 **19 Claims**

1. A brushless direct-current motor comprising: a pair of ferromagnetic rotor plates jointly rotatable about and spaced apart along an axis; at least one axially polarized permanent magnet carried on one of said plates and orbitable about said axis on rotation of said plates; a stator bearing tube extending in the direction of said axis and located radially inward of said axially polarized permanent magnet; a non-magnetic flat stator support between said rotor plates; an electrically energizable coil fixed to said stator support between said plates offset from said axis and spaced axially by a flat air gap from said magnet; and a ferromagnetic flux-conducting reluctance-torque-generating element mounting the flat stator support on the

stator bearing tube, the ferromagnetic flux-conducting element being located radially inward of the axially polarized permanent magnet, the ferromagnetic flux-conducting element comprising a plurality of equiangularly spaced projections cooperating with the magnetic field of the part of said magnet nearest to said axis to generate a reluctance torque, the peripheral outline of said flux-conducting element being point symmetric with respect to said axis.

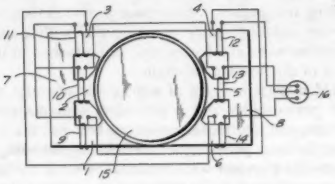


4,181,868

ALTERNATING CURRENT MOTOR

Stefan I. Grosu, Bucharest, Romania, assignor to Institutul de Cercetari Pentru Industria Electrotehnica - ICPE, Bucharest, Romania

Continuation of Ser. No. 775,402, Mar. 7, 1977, abandoned. This application May 17, 1978, Ser. No. 906,856
Claims priority, application Romania, Apr. 8, 1976, 85466
Int. Cl.[2] H02K *1/06*
U.S. Cl. 310—166 **1 Claim**



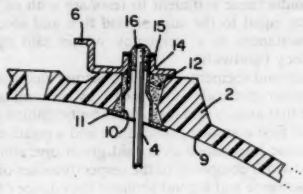
1. An alternating current motor comprising a stator consisting of a stack of rectangular steel sheets and provided with a central circular bore, said stator having a rectangular shape in a plane perpendicular to the axis of said bore and being formed with two groups of three magnetic poles each in mutually parallel relationship, each of said poles extending from an arc of said bore toward a small side of the rectangle parallel to a long side thereof, respective yokes lying along each of the small sides of the rectangle and magnetically bridging the poles of the respective group, said arcs merging continuously with one another around the circumference of said bore, a respective coil on each of the poles with three pairs of coils being provided, each pair of coils having a common axis lying parallel to the respective poles, said groups of poles being disposed mirror symmetrically with respect to a plane perpendicular to said poles through the axis of said bore, a rotor rotatable in said bore, and means for connecting said coils to an alternating current supply source, said means for connecting said coils to said source including a three-phase connector having three terminals each connected to one side of respective coils on the poles of one of said groups, each of said coils on the poles of one of said groups being connected in series with the coil of a respective pair on an opposite pole of the other of said groups.

4,181,869

TUNGSTEN HALOGEN LAMP IN REFLECTOR ENVELOPE

Bernard J. Warren, Hillsboro, N.H., and Peter R. Gagnon, Salem, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 6, 1978, Ser. No. 883,863
Int. Cl.[2] H01K *1/22, 1/28, 1/36*
U.S. Cl. 313—315 **5 Claims**



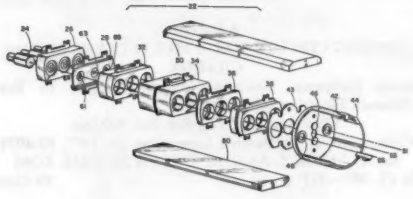
1. A reflector electric lamp comprising: a curved glass reflector; a sealed tungsten-halogen lamp disposed within the reflector; a metal eyelet extending through a hole in the reflector and fastened to the reflector, the inner end of the eyelet having an angled head thereon shaped to approximately conform to the reflector curvature; and a lead-in conductor, one end of which is connected to, and supports, the tungsten-halogen lamp, and the other end of which extends through, and is connected to, the eyelet.

4,181,870

ASSEMBLY OF ELECTRON GUNS HAVING DIFFERENT GAMMA VALUES

Michael T. Stevens, Wilmette, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 8, 1978, Ser. No. 884,670
Int. Cl.[2] H01J *29/08, 29/32, 29/50*
U.S. Cl. 313—414 **8 Claims**



1. For use in a color television picture tube having a faceplate attached to the mouth of a funnel portion; said faceplate having an electron excitable phosphor screen deposited on the inner surface thereof, said phosphor screen having groups of at least two different types of phosphor elements, said funnel portion having a neck attached thereto opposite said mouth, said neck containing an electron gun assembly having at least two electron guns for directing at least two streams of electrons towards said phosphor screen, said two types of phosphor elements differing in the intensity of their light output for a predetermined current in the impinging electron stream, that is, they have different functional dependencies on the current of the electron streams, said electron gun assembly being characterized by having first means in a first electron gun for causing said first electron gun to have a first value of gamma and second means in a second electron gun for causing said second electron gun to have a second value of gamma, said first value of gamma being different from said second value of gamma, said first and second values of gamma for said electron gun assembly being such that the light output intensity ratio of said

two types of phosphor elements is substantially constant for a given ratio of drive voltages on said first and second electron guns.

4,181,871

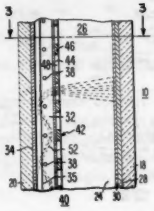
PROXIMITY FOCUSED ELECTRON BEAM GUIDE DISPLAY DEVICE INCLUDING MESH HAVING APERTURES NO GREATER THAN 26 MICRONS IN ONE DIMENSION

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,454

Int. Cl.[2] H01J *29/08, 29/72, 29/56*

U.S. Cl. 313—422 **9 Claims**



1. In a proximity focused display device having an envelope with a front wall and a rear wall spaced from each other, a cathodoluminescent screen on the front wall, a plurality of electron beam guides within the envelope parallel to the rear wall, and a source of an electron beam at one end of each beam guide; the improvement wherein the electron beam guides comprise:

at least one electrode adjacent and parallel to the rear wall; and

an electrically conductive grid parallel to the electrode between the electrode and the front wall, the grid having a plurality of closely spaced apertures, the apertures being no greater than 26 microns in the smallest dimension.

4,181,872

STARTER FOR IGNITING A GAS AND/OR VAPOR DISCHARGE LAMP

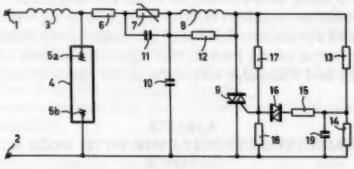
Hubertus M. J. Chermin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,114

Claims priority, application Netherlands, Dec. 1, 1976, 7613356

Int. Cl.[2] H05B *39/04, 41/36*

U.S. Cl. 315—106 **10 Claims**



1. A starter for igniting an electric discharge lamp comprising, two input terminals for connection to a first and a second electrode respectively of the lamp, a first capacitor, means interconnecting the input terminals by means of a series arrangement including an electric coil, a controlled semiconductor switching element and a parallel circuit comprising a PTC resistor and a second capacitor, and means connecting the first capacitor in shunt with a portion of the series arrangement comprising the coil and the semiconductor switching element.

4,181,873

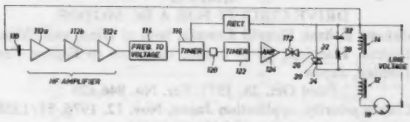
HIGH FREQUENCY DIMMER CIRCUIT FOR HIGH INTENSITY, GASEOUS DISCHARGE LAMP

Eric L. H. Nuver, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Aug. 4, 1978, Ser. No. 930,913

Int. Cl.[2] H05B *41/392*

U.S. Cl. 315—291 **30 Claims**



1. In a gaseous discharge lamp dimming circuit including a ballast connected to the lamp having a gated semiconductor connected thereto for at least partially bypassing an element thereof,

the improvement in a gate-controlling circuit connected to the gate of the semiconductor comprising

receiving means connected to receive a high frequency voltage, said receiving means including means for producing a square wave from the applied high frequency voltage,

frequency-to-voltage converter means connected to said receiving means for producing a voltage proportional to the frequency of the square wave applied thereto,

timing means connected to the line voltage connected for powering the lamp and to said converter means for producing a gate signal to said gated semiconductor, a high frequency voltage to said receiving means at a predetermined lowest frequency producing a full dim brightness response, a high frequency voltage to said receiving means at a predetermined highest frequency producing a full bright brightness response, and a high frequency therebetween producing a brightness response therebetween.

4,181,874

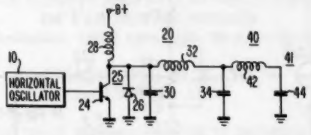
TELEVISION S-CORRECTION CIRCUIT WITH IMPROVED LINEARITY

William E. Babcock, Warren, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,861

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—370 **3 Claims**



1. A television kinescope deflection arrangement having improved linearity; comprising:

a kinescope deflection winding through which an oscillatory current flows at a deflection frequency;

first linearity correction capacitance means coupled in series with said deflection winding and responsive to said oscillatory current to form a deflection linearity correction signal;

retrace capacitance means coupled in parallel with the serial

combination of said deflection winding and said first linearity correction capacitive means;

a deflection switch coupled across said retrace capacitance means and operated at said deflection frequency to form recurrent trace and retrace portions of said oscillatory current;

energy restoring means coupled to said deflection winding for maintaining said oscillatory current; and

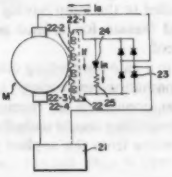
a series resonant circuit coupled in parallel with said first linearity correction capacitance means for reducing the flow of said oscillatory current at the second harmonic of said deflection frequency.

4,181,875

DRIVE CIRCUIT FOR A DC MOTOR

Yoshinori Kohzai; Shigeki Kawada, both of Hino, and Shigeaki Oyama, Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Oct. 28, 1977, Ser. No. 846,429
Claims priority, application Japan, Nov. 12, 1976, 51/135892
Int. Cl.[2] H02K *23/08*
U.S. Cl. 318—252 **6 Claims**



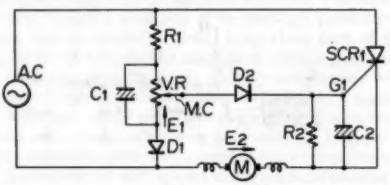
1. A drive circuit for a DC motor having field poles, each composed of a main pole excited by a field winding and with a permanent magnet auxiliary pole, and an armature having an armature winding, wherein the armature winding is connected to the field winding through a rectifier, and wherein a field current is zero when an armature current is less than a predetermined value, and increases or decreases with an increase or decrease in the armature current when the armature current is larger than the predetermined value.

4,181,876

SPEED CONTROL CIRCUIT FOR ELECTRIC MOTORS

Kenji Kato, No. 7-1, 9-chome, Kawabe-machi, Oume-shi, Tokyo, and Haruhiko Tanaka, No. 2-8, 4-chome, Kamirenjaku, Mitaka-shi, Tokyo, both of Japan

Filed Feb. 13, 1978, Ser. No. 877,350
Claims priority, application Japan, Feb. 17, 1977, 52-127289
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—345 G **6 Claims**



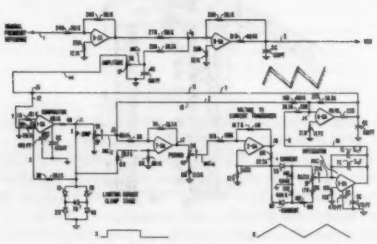
1. A speed control circuit for a single phase series wound commutator motor, comprising: two A.C. terminals connectable to an A.C. power source; a full wave rectifier connected to said A.C. terminals for producing at its output a D.C. full wave voltage; an adjustable voltage divider connected to said D.C. voltage output for providing on its output an adjustable D.C. reference voltage; a series circuit connected to said A.C. terminals and including an electric motor and two antiparallel connected thyristors; and two trigger circuits connected respectively to the gates of said thyristors and to said reference voltage output, said trigger circuits applying to each thyristor a different trigger voltage adjustable by said voltage divider.

4,181,877

INERTIA COMPENSATED STATIC MOTOR DRIVE

Robert S. Gemp, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 743,830, Nov. 22, 1976, abandoned.
This application Dec. 18, 1978, Ser. No. 970,297
Int. Cl.[2] H02P *5/16;* H03K *4/08*
U.S. Cl. 318—345 R **3 Claims**



1. In a motor drive for imparting to a load having inertia reciprocal linear movement in accordance with an intended triangular waveform speed characteristic exhibiting peaks at opposite instants of reversal, including:

integrator means for generating a triangular waveform; and

means responsive to a slope parameter control signal and operative on the input of said integrator means for imparting to said triangular waveform a slope and peaks in accordance with said intended triangular waveform, the combination of:

means responsive to a translation parameter control signal and operative with the output of said integrator means for causing a translation of said triangular waveform in accordance with the magnitude of said translation parameter control signal;

with said translation parameter control signal being subtracted from said slope parameter control signal at the input of said integrator means for changing the slope of said triangular waveform in accordance with the magnitude of said translation parameter control signal, whereby said translation parameter control signal responsive means is outputting a composite of a jump and a triangular waveform which is coterminous with the peaks of a waveform representative of said intended triangular waveform, said jump being proportional to twice the magnitude of said translation parameter control signal and being representative of a predetermined speed increment compensating for the inertia of the load so that said load follows substantially said triangular waveform speed characteristic.

4,181,878

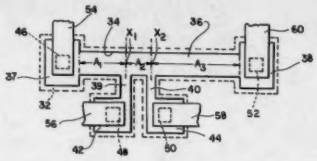
INTEGRATED-CIRCUIT CHIP WITH VOLTAGE DIVIDER

Bruno Murari, Monza, and Silvano Coccetti, Vittuone, both of Italy, assignors to SGS-ATES Component Elettronici S.p.A., Milan, Italy

Filed May 3, 1978, Ser. No. 902,282
Claims priority, application Italy, May 4, 1977, 23145 A/77
Int. Cl.[2] H01L *27/04;* H01C *1/14*
U.S. Cl. 323—94 R **3 Claims**

1. A voltage divider forming part of a monolithic integrated circuit, comprising:

a semiconductor substrate of one conductivity type provided at a surface thereof with an elongate strip zone of the opposite conductivity type terminating in enlarged extremities, said strip zone being provided with at least two transverse branches of the same surface resistivity as said strip zone forming closely adjoining junctions therewith spaced from said extremities, said branches having



free ends remote from said strip zone and being narrower than the latter;

a pair of input electrodes in contact with said extremities connected across a voltage source; and

output terminals in contact with said free ends and connected to respective high-impedance loads for energizing same with fractional voltages substantially equal to those of said junctions.

4,181,879

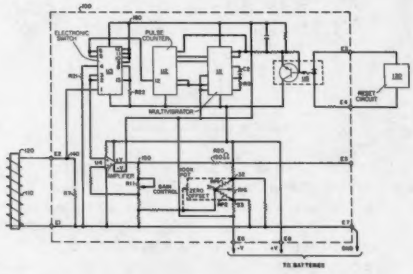
MINE SEARCH COIL SIMULATOR

Gaylon L. West, Ridgecrest, Calif., and John M. Boyle, King George, Va., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1978, Ser. No. 877,546

Int. Cl.[2] G01V *3/10*

U.S. Cl. 324—326 **5 Claims**



1. A mine search coil simulator, comprising:

a passive inductor for producing an electrical signal output in response to motion of a remote ferrous body;

an electronic switch connected to said passive inductor;

an operational amplifier connected to said electronic switch to receive a signal therefrom;

a gain control circuit for controlling the gain of said operational amplifier connected thereto;

an impedance matching circuit connected to said operational amplifier;

a zero off-set for eliminating the effects of environmental electromagnetic fields connected to said gain control circuit;

a pulse counter connected to said electronic switch;

an astable multivibrator connected to said pulse counter for providing pulses thereto;

a light-sensitive transistor having an emitter, a collector and a base, said emitter connected to said astable multivibrator; and

a light-emitting diode having an anode and a cathode, said light-emitting diode configured to supply light to said base of said light-sensitive transistor in response to a control signal applied across said anode and said cathode.

4,181,880

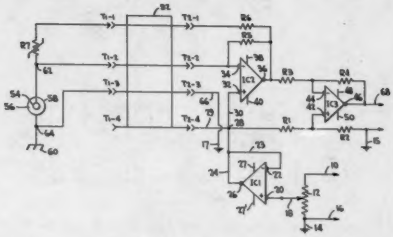
LINEAR GROUND CONDUCTIVITY MEASURING SYSTEM

Horace A. Teass, Jr., 36 Highland Ter., Pleasantville, N.Y. 10570

Filed Mar. 22, 1978, Ser. No. 889,091

Int. Cl.[2] G01N *27/42*

U.S. Cl. 324—439 **3 Claims**



1. A circuit for measuring and linearly indicating the conductivity of a fluid comprising:

a first amplifier having an output for supplying a source voltage to said circuit and providing a low source resistance to said circuit;

a second amplifier having noninverting, inverting and output terminals; wherein said first amplifier output is connected to said second amplifier noninverting input;

a conductivity cell having first and second electrodes, said second electrode being grounded;

a temperature compensating resistor connected to said first cell electrode;

a shielded cable having first, second and third conductors and a first terminal connected to one end of said cable and a second terminal connected to the other end of said cable; whereby said first amplifier output is connected to said second terminal of said cable and said first cable terminal is ungrounded, said first cable conductor being connected between one end of said thermistor and said second amplifier output, said second cable conductor being connected between said first cell electrode and said second amplifier inverting input, and said third cable conductor being connected between said second cell electrode and circuit common.

4,181,881

ELECTRICAL IMPEDANCE MEASURING APPARATUS FOR PROVIDING SEPARATE MEASUREMENTS OF THE CONDUCTIVITY AND DIELECTRIC COEFFICIENT OF VARIOUS MATERIALS

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Filed May 15, 1978, Ser. No. 905,794

Int. Cl.[2] G01R *27/00*

U.S. Cl. 324—57 R **23 Claims**

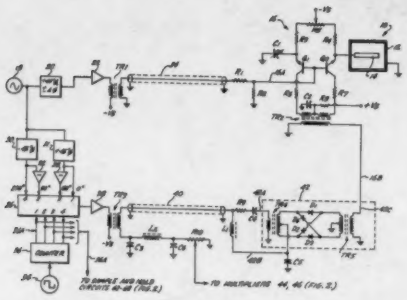
1. An improved apparatus for use in providing separate measurements of the conductivity and dielectric coefficient of a material, said apparatus comprising:

(a) first means for providing a test signal having a predetermined frequency f_0;

(b) second means responsive to said test signal for providing an output signal whose frequency is identical to that of said test signal and whose phase, relative to that of said test signal, and whose amplitude are related to the measured electrical admittance of said material;

(c) third means for providing a reference signal whose fre-

quency is identical to that of said test signal, said third means being adapted to shift the phase of said reference signal at a predetermined frequency f_a, where f_0 is much greater than f_a, so that said reference signal successively has a substantially in-phase and a substantially 90° out-of-phase relationship with said test signal; and



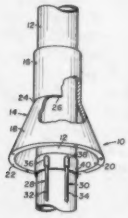
(d) fourth means for mixing said output signal from said second means and said reference signal to provide an output signal which is successively related to the conductivity and to the dielectric coefficient of said material.

4,181,882

CORROSION MONITORING APPARATUS

Hugh S. Isaacs, Shoreham, and John R. Weeks, Stony Brook, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,624
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—71 R **23 Claims**



1. In a system including surfaces and a liquid coolant containing aggressive impurities in communication with the surfaces, wherein impurities tend to cause corrosion of the surfaces, apparatus for anticipating the onset of corrosion in the system comprising:

a. crevice forming means for placement within the system in communication with the liquid coolant,

b. at least a portion of said crevice forming means having a test crevice defined thereon,

c. first probe means positioned in the liquid coolant proximate said test crevice and spaced therefrom for supplying an AC electric wave and for injection of the electric wave through the liquid coolant substantially to said test crevice,

d. and second probe means positioned in the liquid coolant proximate said test crevice and spaced therefrom for receiving a responsive electric wave from said crevice forming means through the liquid coolant;

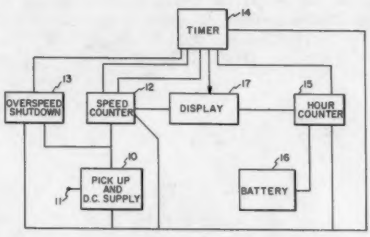
e. said first and second probe means being insulated from direct electrical connection with said crevice forming means, and said test crevice being so positioned on said crevice forming means as to concentrate impurities more rapidly than crevices on the system surfaces so as to enable the determination of corrosion on said crevice forming means prior to and in anticipation of the development of corrosion in the surfaces of the system by monitoring the resultant electric wave received by said second probe for significant changes in the magnitude of said resultant wave indicating the onset of corrosion to permit corrective action to be taken in advance of significant corrosive damage to the system.

4,181,883

HOURMETER-TACHOMETER

Bruce R. Beeghly, and Joseph M. Lepley, both of Youngstown, Ohio, assignors to The Economy Engine Company, Youngstown, Ohio

Filed Jul. 3, 1978, Ser. No. 921,281
Int. Cl.[2] G01P *3/48*; G04F *8/00*; G07C *3/02*
U.S. Cl. 324—166 **7 Claims**



1. An electronic, digital hourmeter-tachometer for use with internal combustion engines or the like comprising:

(a) a programmable timer comprising fixed frequency oscillator and divider circuits for outputting system timing pulses when a d.c. power is applied thereto;

(b) a pulse pick-up circuit comprising means for receiving a pulse, the frequency of which is indicative of the rpm of the engine and for outputting a pulsed signal having a frequency related to said received signal and means for filtering the pick-up pulses to provide a d.c. output for powering the remainder of the digital hourmeter-tachometer;

(c) an electronic hour counter comprising digital counters for counting system timing pulses;

(d) a speed counter for counting the pulsed signal output of the pick-up circuit during an update period controlled by the system timing pulses;

(e) common display means for sequentially displaying the output of the stored count in the hour counter and the speed counter in response to system timing pulses;

(f) means for connecting the d.c. output of the pulse pick-up circuit to power the said programmable timer, hour counter, speed counter, and common display when the pick-up pulses are applied to the pick-up circuit; and

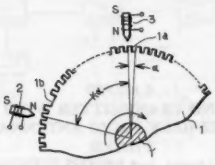
(g) battery means for applying a d.c. current to the hour counter when pick-up pulses are not supplied to the pulse pick-up circuit thereby holding the hour count.

4,181,884

ROTATIONAL POSITION DETECTION DEVICE USING A REFERENCE MARK AND TWO SENSORS SPACED INTEGER TIMES APART

Shinji Shirasaki, Kariya; Takashi Yamada, Anjo; Hiroyasu Fukaya, Nagoya, and Yukio Sakakibara, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 6, 1978, Ser. No. 913,738
Claims priority, application Japan, Jul. 20, 1977, 52/96622[U]
Int. Cl.[2] G01B *7/00*
U.S. Cl. 324—208 **5 Claims**



4. A rotational position detecting apparatus comprising:

a rotatable disk;

a plurality of unit angular informations provided circularly on said rotatable disk and spaced from each other by a first constant angular interval except at a predetermined position indicative of the reference angular position of said rotatable disk, two of said unit angular informations provided beside said predetermined position being spaced from each other by a second constant angular interval which is twice as wide as said first constant angular interval;

a first signal generator positioned adjacent to said rotatable disk for generating a first signal in response to the passing of each of said unit angular informations therethrough;

a second signal generator positioned adjacent to said rotatable disk for generating a second signal in response to the passing of each of said unit angular informations therethrough, said second signal generator being spaced from said first signal generator by a third constant angular interval which is integer times as wide as said first constant angular interval such that said second signal is in a delayed relation with said first signal; and

a comparator means responsive to said first and second signals and effective to compare the amplitude of said first signal with the amplitude of said second signal, said comparator means producing an output pulse signal in synchronization with the passing of said reference angular position of said rotatable disk through said first signal generator.

4,181,885

ELECTRICAL CELL CHARGE ENERGY MEASURING METHOD AND APPARATUS

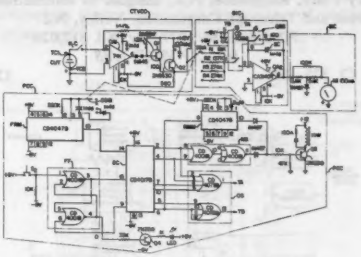
Robert B. Gosser, Hempfield Township., Westmoreland County, and John M. Zomp, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 10, 1978, Ser. No. 904,684
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—428 **10 Claims**

1. Method for non-destructive testing of the charge energy availability of an electrochemical cell of the substantially constant-voltage-during-discharge type, comprising:

establishing a substantially-zero-impedance information-generating short-circuit current path across the terminals of the cell under test,

deriving information respecting integrated current flow through said short-circuit current path during a precise period of time, and



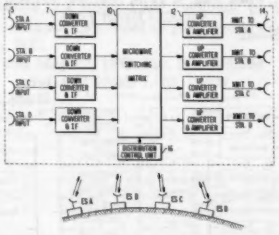
utilizing such information to represent the extent of charge energy available from such cell.

4,181,886

DISTRIBUTION CONTROL UNIT PROVIDING SIMULTANEOUS HYBRID FDMA AND SS-TDMA OPERATION IN A TRANSITIONAL SATELLITE SWITCHED SYSTEM

Richard S. Cooperman, Silver Spring, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,625
Int. Cl.[2] H04B *7/185*
U.S. Cl. 325—4 **3 Claims**



1. In a communications satellite system of the space division type including spot beam antennas receiving uplink communications signals from a plurality of earth stations and transmitting said uplink signals over downlinks to said earth stations, said uplinks being communicated to said downlinks through a switching matrix forming an array of inputs and outputs interconnected in a row and column fashion through electrically controllable crosspoint switching elements, each uplink being designated to a different matrix input and each downlink to a different matrix output, and a distribution control unit for controlling the conductive states of said crosspoint switching elements, the improvement comprising:

(a) means associated with said distribution control unit for generating digital control words, each bit position of said words functioning to control the conductive state of a different crosspoint switching element, and

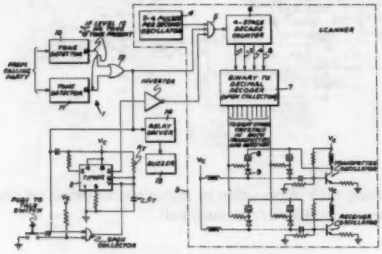
(b) means responsive to said digital control words for selectively and simultaneously rendering any number of said crosspoint switching elements conductive to thereby effect point-to-multipoint interconnection between the matrix inputs and outputs.

4,181,887

AUTOMATIC CHANNEL SELECTOR FOR A TWO-WAY TRANSCEIVER IN A MULTICHANNEL COMMUNICATION SYSTEM

Harry Place, Ridgewood, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jun. 30, 1977, Ser. No. 812,026
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—15 **12 Claims**



1. An automatic channel selector for a two-way transceiver in a multichannel communication system comprising:

first means to scan each of the channels of said system; and

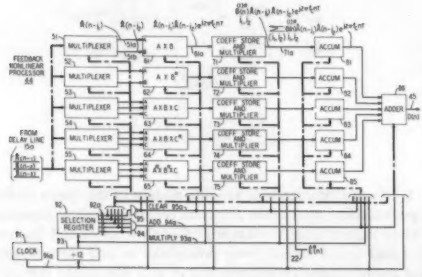
second means coupled to said first means responsive to only the simultaneous presence of two different calling tones on a channel to produce a control signal to stop the scanning of said first means.

4,181,888

FEEDBACK NONLINEAR EQUALIZATION OF MODULATED DATA SIGNALS

David D. Falconer, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 4, 1978, Ser. No. 931,025
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—42 **31 Claims**



1. An arrangement for equalizing samples of a received modulated data signal having a predetermined carrier frequency, said arrangement including means operative in response to said samples for forming decisions as to the values of data symbols represented thereby, each of said decisions being represented by a complex number,

characterized in that said arrangement further includes means (**51–55, 61–65**) for forming a plurality of signal products associated with an individual one of said samples, each multiplicand of each product being derived from a respective one of said decisions, each said respective one of said decisions bearing a predetermined temporal relationship to said one of said samples, at least one multiplicand of individual ones of said signal products being the complex conjugate of the decision from which said one multiplicand is derived, and means (**71–75**) for multiplying each of said products by an associated coefficient and by a predetermined harmonic of said carrier frequency to form a plurality of modulated weighted products,

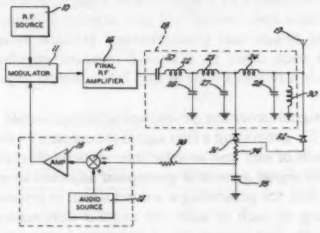
said decision forming means including data recovery means (**14, 17**) for forming a decision as to the value of the data symbol represented by said one of said samples in response to said modulated weighted products.

4,181,889

CITIZENS BAND TRANSMITTER WITH OVERALL ENVELOPE FEEDBACK FROM ANTENNA COUPLING FILTER

James L. Davis, Kokomo, and Michael J. Easterwood, Russiaville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,466
Int. Cl.[2] H04B 1/04
U.S. Cl. 325—124 **1 Claim**



1. In an AM citizens band transmitter including means effective to generate a carrier signal at a radio frequency, means effective to modulate the radio frequency carrier signal with an audio frequency signal, means effective to amplify the modulated radio frequency carrier signal and an antenna, all said means except the antenna adapted to be contained within a case, a coupling and protective circuit adapted for containment within the case and comprising, in combination:

a coupling circuit effective to couple the modulated RF signal amplifying means to the antenna, said circuit including at least one LC-type harmonic suppressing filter having a phase shift of substantially 90 degrees or an odd multiple thereof at the radio frequency, whereby the AC voltage at one end of the filter thus varies proportionally with the AC current at the other end of the inductor;

a first diode having a cathode connected to the one end of the filter;

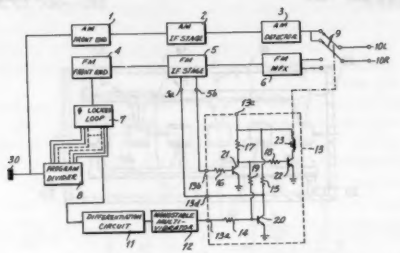
a second diode having a cathode connected to the other end of the filter, the anodes of the first and second diodes being connected together, whereby the voltage at the connected anodes varies as the greater of the voltage and current at the other end of the inductor;

a low pass filter connecting the anodes of the diodes to the RF carrier signal modulating means so as to provide thereto in negative feedback a signal varying with the envelope of the greater of the voltage and current supplied to the antenna to reduce distortion in the modulated RF signal amplifier and protect it from low antenna impedance, said feedback being accomplished totally with circuitry adapted for containment within the case.

4,181,890
APPARATUS FOR RECEIVING SIGNALS IN PLURAL FREQUENCY BANDS

Kenji Yamamoto, Kashiwa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1978, Ser. No. 923,621
Claims priority, application Japan, Jul. 12, 1977, 52-82612
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—316 6 Claims



1. Radio receiving apparatus for receiving signals in plural frequency bands, comprising:

plural signal processing channels, each associated with a respective frequency band and each tunable to different frequencies within said respective frequency band to derive information signals from the signals which are received at the frequencies to which said signal processing channel is tuned;

output means for providing the information signals derived by said signal processing channels;

controllable switch means for connecting a selected one of said signal processing channels to said output means to supply said derived information signals thereto;

pulse generating means for generating intermittent pulse signals when the tuning condition of at least one of said signal processing channels is changed;

sampling means responsive to each said pulse signal for sampling the tuning condition of said one signal processing channel to determine if said one signal processing channel is tuned to a frequency so as to derive an information signal; and

switch control means responsive to said sampling means for controlling said switch means to connect said one signal processing channel to said output means when said one signal processing channel is tuned to a frequency to derive said information signal.

4,181,891
CHANNEL CHANGE INDICATION CIRCUIT

Peter C. Skerlos, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 5, 1978, Ser. No. 912,790
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—464 7 Claims

1. A limited channel tuning system for a television receiver comprising:

channel address means generating channel address information;

memory means, having inputs addressable by said channel address information, storing channel tuning information for different television channels and having a useful service life dependent upon cumulative activation time;

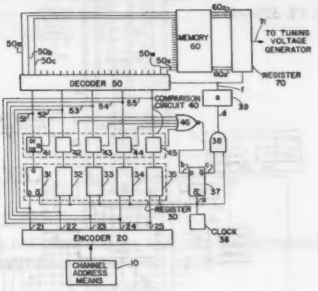
register means coupled to said channel address means for receiving therefrom and retaining desired channel address information;

pulse means coupled to said memory means for producing pulses for activating said memory means;

comparator means having a first set of inputs coupled to said register means, a second set of inputs coupled to said channel addressable inputs of said memory means and an output coupled to said pulse means;

clock means periodically energizing said register means;

said comparator means comparing the content of said register means with the channel addressable inputs of said



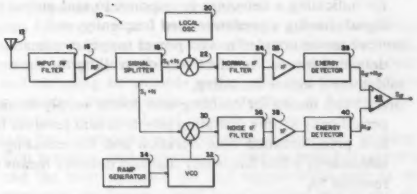
memory means and producing an enabling signal for said pulse means only when a difference is detected therebetween;

whereby said pulse means activates said memory means only when a change has occurred in the channel address information.

4,181,892
SWEEPING NOISE BLANKER

Douglas M. Dilley, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1978, Ser. No. 905,304
Int. Cl.[2] H04B 1/10, 15/00
U.S. Cl. 325—474 8 Claims



1. A noise reduction network comprising:

first means for receiving an input signal having an input noise component and an input desired signal component and for providing an output signal comprised of an output noise component and an output desired signal component;

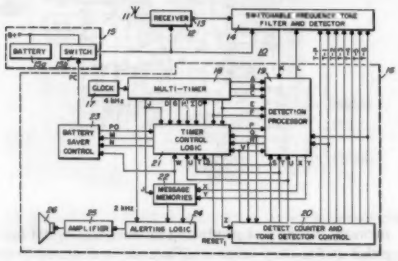
second means comprising a swept heterodyne oscillator connected to said first means for substantially removing said output desired signal component from said first means output signal and for providing an output that is substantially entirely said output noise component; and

third means operably connected to said first and second means for combining said second means output with said first means output noise component and said first means output desired signal component and for outputting a third means output signal comprised substantially entirely of said first means output desired signal component.

4,181,893
BATTERY SAVER FOR A TONE CODED SIGNALLING SYSTEM

Edward L. Ehmke, Margate, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 590,537, Jun. 26, 1975, abandoned.
This application Dec. 30, 1976, Ser. No. 755,696
Int. Cl.[2] H04B 5/04
U.S. Cl. 325—492 29 Claims



1. An improved battery saver circuit for use with personalized radio apparatus operable on receipt of a predetermined sequential tone code having at least first, second, and third tones, said battery saver circuit comprising:

receiver means for receiving tone modulated input signals and providing corresponding output tone signals in response thereto at a reference terminal;

power supply means coupled to said receiver means for selectively supplying operating power thereto;

detector means coupled to said receiver reference terminal for indicating a detection in response to said output tone signals having a predetermined frequency; and

control means coupled to said power supply means and said detecting means for selectively controlling the same;

said control means including,

first circuit means for enabling said power supply means to periodically supply operating power to said receiver for a first predetermined time duration and for effecting the selection of a first frequency that said detector means will respond to,

second circuit means for enabling said power supply means to supply operating power for a second predetermined time duration in response to said first frequency being detected during said first time duration,

third circuit means for enabling said power supply means to supply operating power for a third predetermined time duration and effecting the selection of a second frequency in response to said first frequency being detected during said second time duration,

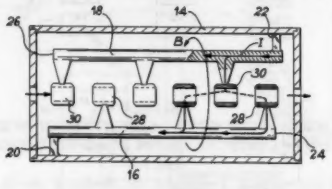
fourth circuit means for enabling said power supply means to supply operating power for a fourth predetermined time duration and effecting the selection of a third frequency in response to said second frequency being detected, and

fifth circuit means for effecting the selection of said second frequency in response to said third frequency not being detected within a predetermined time window after said second frequency has been detected.

4,181,894
HEAVY ION ACCELERATING STRUCTURE AND ITS APPLICATION TO A HEAVY-ION LINEAR ACCELERATOR

Jacques Pottier, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 26, 1978, Ser. No. 900,128
Claims priority, application France, May 5, 1977, 77 13700
Int. Cl.[2] H01J 23/18, 25/02; H05H 7/00
U.S. Cl. 328—233 8 Claims

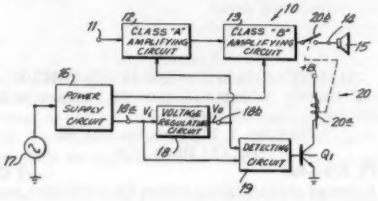


1. An ion accelerating structure comprising a cavity having a lateral wall, an entrance face, an exit face, and an axis, said cavity being resonant at an operating wavelength, said cavity containing a first pair of longitudinal conducting supports electrically connected on said lateral wall only at a point located near said entrance face for one support and near said exit face for the other support at a distance from said faces which is less than one fifth of said operating wavelength, said supports being each in quarter-wave resonance and in opposite phase relative to each other, and drift tubes electrically connected alternately to each of said supports.

4,181,895
AMPLIFIER WITH MUTING CIRCUIT

Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,036
Claims priority, application Japan, Aug. 29, 1977, 52/115398[U]
Int. Cl.[2] H03G 3/30
U.S. Cl. 330—279 6 Claims

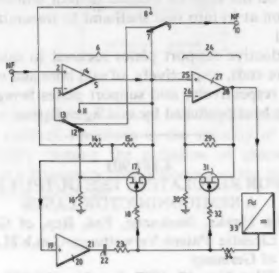


1. An amplifier comprising: a signal input terminal; a signal output terminal; a signal amplifying circuit connected between said signal input and output terminals; a DC power supply; a voltage regulating circuit having an input connected to said DC power supply, and an output connected to said signal amplifying circuit; switching means connected to said signal amplifying circuit for muting the output signal from the latter; and detecting circuit means for detecting a voltage difference between said input and output of said voltage regulating circuit and for controlling said switching means in accordance with the detected voltage difference.

4,181,896
DEVICE FOR OPTIONAL DYNAMIC COMPRESSION OR EXPANSION

Ernst Schroder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H, Frankfurt, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,194
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735500
Int. Cl.[2] H03G 3/20, 7/08
U.S. Cl. 330—282 5 Claims



1. In a circuit for the optional dynamic compression or expansion of an input signal, said circuit including a useful signal path having at least one variable gain amplifier therein for receiving said input signal; an auxiliary branch path having at least one variable gain amplifier and a control signal generator therein, the input of said auxiliary branch path being coupled to said useful signal path; said first and second field effect transistors each having a control electrode coupled to the output of said auxiliary branch path for receiving a direct control voltage, each of said first and second field effect transistors further having a source-sink path coupled to respective amplifiers in said useful signal path and said auxiliary branch path for controlling the gains thereof; wherein the improvement comprises:

a voltage divider having a voltage tap thereon coupled across the source-sink path of said first field effect transistor; and

a separating amplifier coupling the voltage tap of said voltage divider to the control electrodes of said first and second field effect transistors to provide an alternating voltage therefor.

4,181,897
HIGH POWER MOLECULAR GAS LASER

Coleman J. Miller, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

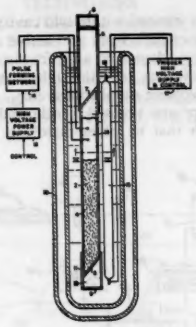
Filed Jun. 26, 1968, Ser. No. 740,221
Int. Cl.[2] H01S 3/223
U.S. Cl. 331—94.5 G 45 Claims

1. In a molecular gas laser the method of generating coherent output radiation comprising the steps of:

(a) generating a particle flux including electrons having an average kinetic energy approximately equal to the upper molecular vibrational energy state of the electronic ground state of said laser gas,

(b) maintaining said gas at a pressure of the order of atmospheric pressure,

(c) coupling said particle flux with said gas in an optical resonator to energize said laser gas by resonant collisions of the molecules of said gas with said particle flux to create a population inversion between two radiatively coupled energy states, one of which is below said upper molecular vibrational energy state, and,

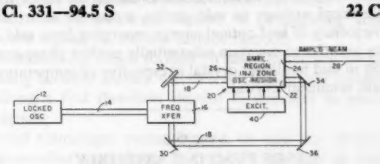


(d) resonating radiation resulting from downward transitions between said radiatively coupled states.

4,181,898
CONTROLLED FREQUENCY HIGH POWER LASER

Gary L. McAllister, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Mar. 28, 1977, Ser. No. 781,800
Int. Cl.[2] H01S 3/10
U.S. Cl. 331—94.5 S 22 Claims



1. A frequency controller laser comprising:

means for providing laser radiation of a predetermined frequency;

a laser medium;

means for defining a regenerative path for laser radiation encompassing said laser medium;

means for exciting said laser medium to a lasing condition whereby radiation from said medium travels on said path;

means for amplifying the radiation within said laser medium and including an unstable cavity with said laser medium positioned therebetween and extending to between peripheral positions of said unstable cavity;

means for maintaining a predetermined frequency relationship between said radiation of predetermined frequency and the laser radiation on said regenerative path in response to the lasing of said laser medium and in the absence of radiation of said predetermined frequency on said regenerative path.

4,181,899
HIGH POWER OPTICAL SECOND HARMONIC GENERATION IN NON-LINEAR CRYSTALS

Yung S. Liu, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,419
Int. Cl.[2] H01S 3/13
U.S. Cl. 331—94.5 C 20 Claims

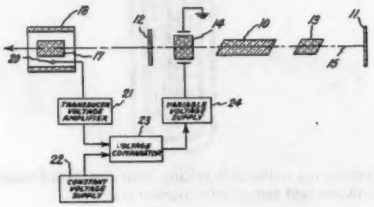
1. A high power, Q-switched, tunable laser providing optical energy at both a fundamental frequency and harmonic frequency thereof, comprising:

an optically-resonant cavity having reflective means at either end thereof, one of said reflective means being partially transmissive;

an active laser medium disposed within said cavity so as to emit optical energy along an optic axis in a direction normal to the reflecting surface of each of said reflective means;

tuning means situated within said cavity in the path of optical energy emitted from said active medium, said tuning means being adapted to alter frequency at which optical energy may pass therethrough in accordance with an electrical voltage supplied thereto;

a nonlinear crystal situated astride said optic axis and oriented such that its phase-matching direction coincides



with the path of optical energy emerging from said cavity through said partially-transmissive reflective means;

transducer means responsive to temperature of said nonlinear crystal for producing an electronic indication of any change in temperature of said nonlinear crystal; and

means responsive to said transducer means for supplying an electrical voltage to said tuning means so as to adjust frequency of said optical energy emerging from said cavity in order to maintain substantially perfect phase-matching in said nonlinear crystal irrespective of temperature of said nonlinear crystal.

4,181,900

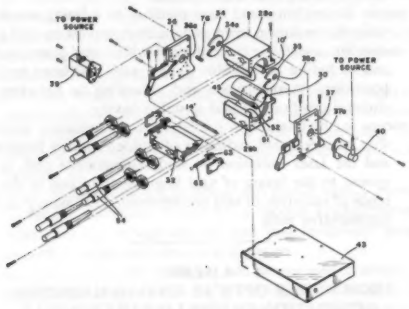
LASER PUMPING ASSEMBLY

Joseph D. Tajnai, Sunnyvale; Curt H. Chadwick, Los Altos, and Dan J. Radecki, San Jose, all of Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,511

Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 P **1 Claim**



1. In a conductively cooled laser pumping assembly comprising a split housing having an elliptically shaped bore with first and second focal axes, said sections being connected symmetrically about a plane containing said axes and being spaced apart adjacent to said first axis whereby to define an elongated opening in said housing, a unitary elliptically shaped transparent shell snugly fitted in said bore and having focal axes coincident with said first and second axes, respectively, said shell also having an elongated slot aligned with said opening in said housing, lamp means supported within said shell and having an axis coincident with said second axis, said lamp means being adapted to radiate noncoherent light at a desired wavelength λ_1 and at undesired wavelengths λ_u, said shell being covered by a thin layer of a dielectric substance, said layer being highly reflective at λ_1 and highly transmissive at λ_u and a cylindrical rod of lasing material supported within said shell with the rod axis coincident with said second axis, the improvement comprising

end plates engaging opposite ends, respectively, of said shell, said end plates being formed of a material substantially transparent to radiation at wavelengths λ_1 and λ_u,

each of said plates having a coating of said dielectric substance on the exterior surface thereof whereby to reflect radiation at λ_1 into said shell and to transmit radiation at λ_u, and

heat conductive support plates secured to said housing at opposite ends, respectively, of said bore and over said end plates, respectively, said support plates being adapted to remove heat produced by said λ_u radiation.

4,181,901

METHOD FOR REGULATING THE OUTPUT POWER OF A SEMICONDUCTOR LASER

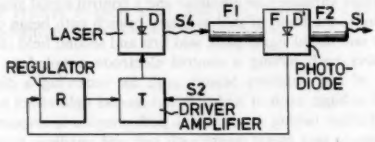
Hans-Joachim Heyke, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,570

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652608

Int. Cl.² H01S *3/13*

U.S. Cl. 331—94.5 S **9 Claims**



1. In an arrangement for regulating the output power of a semiconductor laser for a data transmission system including a light conductive fiber optically coupled to a semiconductor laser and through which the output signal of the laser is transmitted, a photodiode responsive to light energy produced by said laser, and means responsive to the output signal of said photodiode for regulating the current of the laser; the improvement wherein: said photodiode is a thin-film photodiode which is transparent for the light frequencies to be transmitted via said light-conductive fiber and is inserted in the transmission path of said light-conductive fiber.

4,181,902

FLUXON OSCILLATORS UTILIZING A RING SHAPED JOSEPHSON JUNCTION

Alwyn C. Scott, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 12, 1978, Ser. No. 923,955

Int. Cl.² H01L *39/22;* H03B *15/00*

U.S. Cl. 331—107 S **15 Claims**

1. A fluxon oscillator, comprising

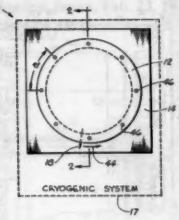
first and second closely spaced superconductive members having a ring-shaped Josephson junction barrier therebetween capable of supporting the tunnelling of superconductive electrons across said barrier and between said superconductive members,

means for initially producing at least one fluxon in said barrier,

means for producing a biasing current between said superconductive members and across said barrier for causing

movement of said fluxon along and around said ring-shaped barrier in a closed path,

and means for producing a plurality of centers of enhanced superconductive electron current across said barrier,



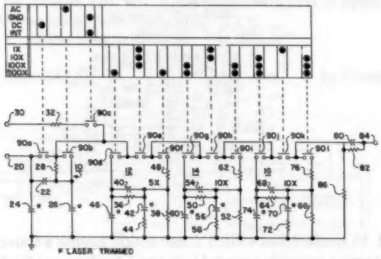
said centers being spaced around said ring-shaped barrier for causing cyclical variations in the velocity of the fluxon and thereby causing the radiation of electromagnetic energy at a frequency corresponding to the frequency of said cyclical variations.

4,181,903

HYBRID CASCADE ATTENUATOR

Kenneth C. Holland, Portland; Gary W. Reed, Beaverton, and Desmond L. Murphy, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 14, 1978, Ser. No. 877,776
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 R **7 Claims**



1. An attenuator device, comprising:

an insulative substrate having a substantially planar surface;

a plurality of resistive elements disposed on said substrate surface; said resistive elements comprising resistive film;

a plurality of parallel plate capacitors disposed on said substrate surface; each of said capacitors comprising a lower plate having a predetermined configuration, an upper plate having a predetermined configuration defining a series of segments of predetermined area connected together at one end by a common bus, and a dielectric film disposed intermediate said lower and upper plates; and

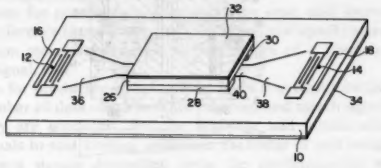
a plurality of conductive circuit paths disposed on said substrate surface interconnecting said resistive elements and said capacitors to form a plurality of coplanar attenuator circuits of different attenuation values.

4,181,904

ACOUSTIC-WAVE CONVOLVERS UTILIZING DIFFUSED WAVEGUIDES AND BEAM COMPRESSION TECHNIQUES

Joseph F. Weller, Oxon Hill, Md.; James D. Crowley, Menlo Park, Calif., and Thomas G. Giallorenzi, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1978, Ser. No. 932,248
Int. Cl.² H03H *9/26, 9/30;* H03K *5/159;* H01L *41/08*
U.S. Cl. 333—153 **6 Claims**



1. An acoustic-surface-wave device comprising:

a piezoelectric substrate capable of propagating acoustic wave signals on the top surface thereof;

first transducer means formed on said top surface for generating acoustic surface waves traveling on said top surface along a first direction thereof in response to electrical signals;

second transducer means formed on said top surface for generating acoustic surface waves traveling on said top surface along a second direction thereof in response to electrical signals;

first energy concentrator means for compressing the acoustic surface wave received from said first transducer means to a reduced beamwidth;

second energy concentrator means for compressing the acoustic surface wave received from said second transducer means to a reduced beamwidth;

channel waveguide means for receiving the concentrated acoustic surface waves of reduced beamwidth from the first and second energy concentrator means in opposite ends thereof, said channel waveguide means being formed in said substrate by diffusion of metal into said substrate to increase the acoustic-wave velocity in the in-diffused region, the in-diffused region being the cladding of said waveguide and the non-in-diffused region being the core of said waveguide;

first conductive means forming a ground electrode on the bottom surface of said substrate; and

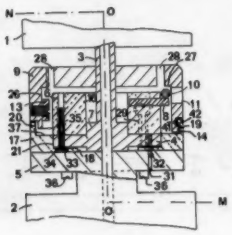
second conductive means forming at least one electrode on the top surface of said substrate, the signal between said first and second conductive means representing the interaction between the acoustic surface waves generated by said first and second transducer means,

said first and second energy concentrator means comprising first and second horn-shaped channel waveguides, said horn-shaped channel waveguides being formed in said substrate by diffusion of metal into said substrate to increase the acoustic-wave velocity in the in-diffused regions, the in-diffused regions being the cladding of said horn-shaped channel waveguides and the non-in-diffused regions being the core of said horn-shaped channel waveguides.

4,181,905
QUICK RELEASE CONNECTOR FOR WAVEGUIDE CIRCUITS

Andre Bouvard, and Jean-Rene Mahieu, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jun. 23, 1978, Ser. No. 918,651
Claims priority, application France, Jul. 21, 1977, 77 22336
Int. Cl.[2] H01P *1/00*
U.S. Cl. 333—255 **6 Claims**



1. A releasable interconnection for two waveguide circuits comprising a rotatable ring mounted around a first waveguide circuit terminated by a standard flange and a fixed base solid with the second waveguide circuit matching said ring in which:

said first waveguide circuit is surrounded by a cylindrical sleeve coaxial with the waveguide and fastened to said flange carrying three radial protruding pins 120 degrees apart, said sleeve being disposed inside said ring

said ring carries on its inside a first set of three steel spring rodlike guides set at both ends in said ring 120 degrees apart and inclined at 70° on the axis of the ring provided with an interlocking central groove matching the dimensions of the section of said pin and a second set of three semicircular cams 120° degrees apart which cooperate with said pins during rotation of said ring so that said pins will pass between said guides and cams, said ring being provided at its lower end with three externally protruding grips 120 degrees apart

said base is provided at its upper end with an inner circular groove in which said grips can penetrate through three apertures

means for preventing false relative positioning of said waveguides in both said terminating flanges.

4,181,906
CIRCUIT INTERRUPTER WITH INTERLOCKED REMOVABLE TRIP UNIT

Joseph J. Matsko, Beaver; Emroy W. Lange, Brighton Township, Beaver County, and Paul Skalka, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1977, Ser. No. 853,983
Int. Cl.[2] H01H *75/02, 77/02*
U.S. Cl. 335—6 **8 Claims**

1. A circuit interrupter, comprising:

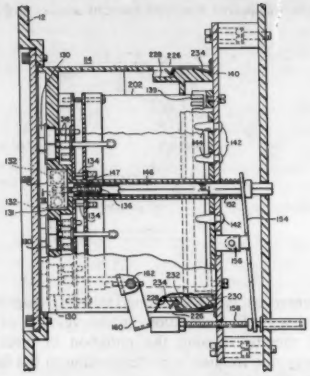
a housing comprising a removable cover,

a circuit breaker mechanism disposed in said housing, and comprising separable contacts operable between open and closed positions and a trip mechanism releasable to effect automatic opening of said contacts;

means for sensing current flow through said contacts;

a removable trip unit disposed in said housing and connected to said sensing means and said trip mechanism, said trip limit causing release of said trip mechanism upon overcurrent conditions through said contacts; and

mounting means for securing said trip unit to said housing, said mounting means permitting said trip unit to be inserted into said housing with said cover in place but disposed within said housing so as to be inaccessible without

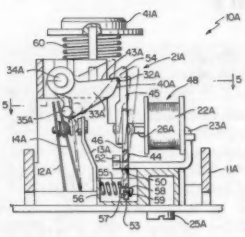


removal of said cover, thereby preventing removal of said trip unit without first removing said cover.

4,181,907
ELECTRICAL SWITCH CONSTRUCTION HAVING ARMATURE LATCH

Felix F. Esposito, and Roger P. Sepso, both of Stratford, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 22, 1978, Ser. No. 908,125
Int. Cl.[2] H01H *9/20*
U.S. Cl. 335—170 **12 Claims**

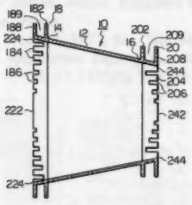


1. In an electrical switch construction having a frame means carrying a movable switch blade and a latch means for latching said switch blade in one position when said latch means is latched and for causing said switch blade to be in another position when said latch means is unlatched, said latch means comprising an armature movably carried by said frame means and a cam movably carried by said frame means and being operatively associated with said switch blade to hold said switch blade in said one position thereof when said cam is latched by said armature being in a latching position thereof, said armature being moved to an unlatching position from said cam when said armature is actuated by an electromagnetic actuator carried by said frame means, the improvement wherein said armature comprises two members secured together, one of said members being formed of plastic material and having means for latching with said cam, the other of said members being formed of metal to be magnetically attracted by said actuator.

4,181,908
DEFLECTION COIL

Norio Yoshikawa, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,477
Claims priority, application Japan, Feb. 23, 1977, 52-21132[U]
Int. Cl.[2] H01F 7/00
U.S. Cl. 335—210 2 Claims

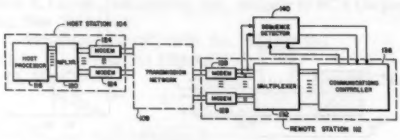


1. A deflection coil having a coil frame and a wire wound thereon, said coil frame comprising a flared coil bobbin and guides provided on the front and rear ends of said coil bobbin integral therewith, wherein the guides at the front and rear ends of said coil bobbin each have a plurality of circumferentially spaced coil winding insertion slots, wherein said coil winding insertion slots in at least one of said guides are formed such that the slot depth in the axial direction of a CRT is shallow in the vicinity of a window formed in the guide, with the depth of each slot becoming successively deeper as the slots become more distant from said window, and wherein the wire of the deflection coil is wound through the coil insertion slots in said guide in a saddle-type configuration along the inside surface of the coil frame.

4,181,909
METHOD AND APPRATUS FOR INITIALIZING REMOTE DATA COMMUNICATION EQUIPMENT

Samuel C. Pyeatte, Granger, Utah, and Michael M. Austin, Bad Soden am Taunus, Fed. Rep. of Germany, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,377
Int. Cl.[2] H04Q 9/04
U.S. Cl. 340—147 SY 16 Claims



1. In a data communications system having one or more host stations, one or more remote stations, and means interconnecting said stations, said host station including means for transmitting predetermined sequences of data characters over said interconnecting means to said remote station, and said remote station including data processing equipment, data storage units, and loading apparatus responsive to initialization signals for applying data to the data processing equipment from a data storage unit identified by said initialization signals, apparatus for initializing said remote station comprising

means coupled to said interconnecting means for receiving and temporarily storing data transmitted by said host station,

means coupled to said receiving and storing means for detecting receipt of said predetermined sequences of data characters, said detecting means comprising

means for producing first reference signals in response to received data characters,

resettable means for producing second reference signals,

means for producing a sync signal in response to certain reference signals being produced by said first reference signal producing means,

resettable synchronization means responsive to said sync signal for thereafter producing a comparator signal and a character clock signal each time a certain number of data bits are received from the host station,

comparing means responsive to said comparator signal for comparing said first reference signals with said second reference signals, and for producing a match signal if the compared signals match and a mismatch signal if the compared signals do not match,

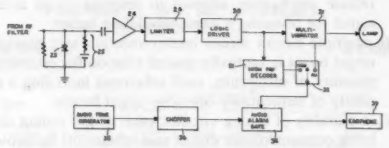
means for producing a reset signal to reset said second reference signal producing means and said synchronization means in response to production of a mismatch signal, and

means for producing initialization signals if at least a certain number of data characters are received and match signals only are produced, and for applying said initialization signals to said loading apparatus, the value of said initialization signals depending upon the predetermined sequence received.

4,181,910
PORTABLE RADAR-DETECTING RECEIVER

Allan B. Hitterdal, Woodland Hills, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 14, 1977, Ser. No. 860,388
Int. Cl.[2] G01S 7/40; H04B 17/00
U.S. Cl. 343—18 E 2 Claims



1. A portable radar-detecting device comprising:

a. container means;

b. a short length of rigid transmission line secured at one end to said container means;

c. a miniature antenna fastened to the other end of said transmission line;

d. battery operated circuitry in said container means including a broadband detector and alarm control means responsive to pulses in the output of said detector, said alarm control means comprising a retriggerable monostable multivibrator having an "on" time greater than the period of the pulses to be detected, and means for feeding pulses from said detector to the trigger point of said multivibrator so that the output of said multivibrator is a constant voltage alarmenergizing signal while said multivibrator is "on"; and

e. alarm means operatively connected to said alarm control means, said alarm means comprising a first generator (43) for producing an audio tone, a second generator (44) for producing a pulse type signal at a frequency substantially less than an audio tone, a first NAND gate (45) having two inputs and an output, the first input of said first NAND gate connected to the output of one of said generators, and the second input of said first NAND gate connected to the output of the other said generator; a second NAND gate (34) having two inputs and an output, means (71) connecting the first input of said second NAND gate (34) to the output of said first NAND gate (45), and means (32) connecting the second input of said second NAND gate (34) to the output of said multivibrator (31); an ear-

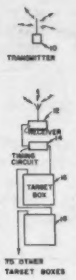
phone (39); and signal coupling means (72) connecting the input of said earphone to the output of said second NAND gate (34).

4,181,911

TARGET RELEASE SYSTEM

Billy E. Black, 232 Monte Vista Dr., Bakersfield, Calif. 93305

Filed Feb. 18, 1977, Ser. No. 770,184
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—225 **14 Claims**



1. A target release system for use in simulating the hunting of wild game in a simulated environment for the game comprising:

A. a plurality of target boxes secluded in a selected environment and arranged in mutually spaced relation, each box being characterized by an electrically energizable target release mechanism adapted to respond to an actuating signal for releasing a game-simulating target;

B. multiple circuit means interconnecting said plurality of target boxes in mutually spaced relation for establishing a plurality of surcircuits, each subcircuit including a multiplicity of sequentially operable target boxes;

C. a plurality of timing circuits, each of the timing circuits being connected with one of said subcircuits for providing an actuating signal thereto in response to an applied timing circuit driver signal for a period of a fixed duration;

D. a plurality of secluded signal receiver circuits, each being connected with one of said timing circuits for providing a timing circuit driver signal output in response to a radio signal of a selected frequency received thereby; and

E. a portable radio signal transmitter for providing a continuous radio signal at selected frequencies, adapted to be worn on the person of a user of the system, whereby game-simulating targets are released as the transmitter is transported into the vicinity of the secluded receivers as the user moves through the simulated environment.

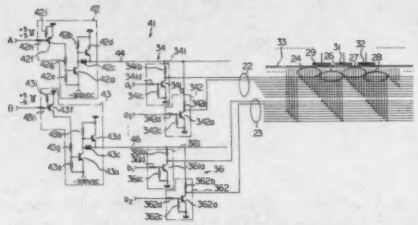
4,181,912

ELECTROSTATIC RECORDING APPARATUS COMPRISING IMPROVED ELECTRODE SWITCHING MEANS

Yoshiaki Satake, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1978, Ser. No. 900,166
Claims priority, application Japan, May 12, 1977, 52-54722; May 13, 1977, 52-55003; May 14, 1977, 52-55678
Int. Cl.[2] G01D 15/06; G03G 15/048
U.S. Cl. 346—154 **9 Claims**

1. An electrostatic recording apparatus comprising:
a power source;
a plurality of first bus lines;
a plurality of second bus lines;
a plurality of first recording electrodes connected to the first bus lines respectively;
a plurality of second recording electrodes connected to the second bus lines respectively;
first input means for receiving and storing first data signals;
second input means for receiving and storing second data signals;
a plurality of first data switch means connected between the power source and the first bus lines and being further connected to the first input means to receive the first data signals respectively as gate inputs;
a plurality of second data switch means connected between



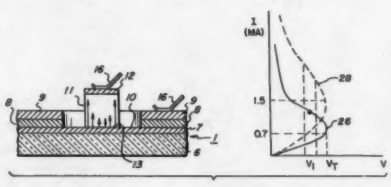
the power source and the second bus lines and being further connected to receive the second data signals respectively as gate inputs;
first power switch means connected between the power source and all of the first data switch means;
second power switch means connected between the power source and all of the second data switch means; and
control means for alternatingly applying first and second recording signals to the first and second power switch means for turning on the first and second power switch means.

4,181,913

RESISTIVE ELECTRODE AMORPHOUS SEMICONDUCTOR NEGATIVE RESISTANCE DEVICE

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 801,959
Int. Cl.[2] H01L 45/00
U.S. Cl. 357—2 **7 Claims**



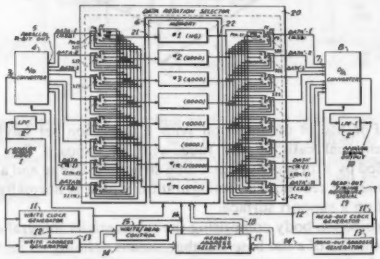
1. A semiconductive negative resistive device comprising
a first solid state element of semiconductive glass material capable of exhibiting a voltage-current characteristic having negative differential resistance behavior with a generally high resistance region below a threshold voltage and a low resistance region beyond said threshold voltage wherein a current filament behavior may be observed,
first electrode means disposed on a major surface of said first element,
a second solid state element of resistive material disposed on the major surface of said first element opposite to said first mentioned major surface, said second element having a sheet resistivity in the range from about 10 to about 10^6 ohms per square to provide desired slope behavior of said low resistance region and control the extent of the area of

the current filament established in said first element when the device is operating in said low resistance region, and second electrode means secured to said second element.

4,181,914
SYSTEM FOR REDUCING TRANSMISSION PROBLEMS IN A PARALLEL DIGITAL DATA TRANSMISSION SYSTEM

Masao Inaba; Atsumi Sugimoto; Mikio Shimizu, and Toshitake Kouyama, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,028
Claims priority, application Japan, Dec. 20, 1976, 51-153683
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—1 **6 Claims**

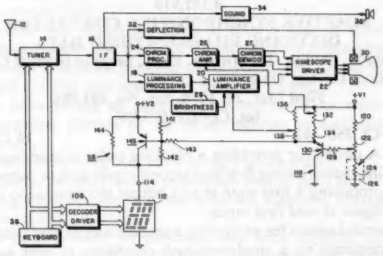


1. A parallel data system for storing an information signal in the form of a succession of binary codewords each having n bits (where n is an integer more than one), each of the n bits being data bits utilized only to represent the information content of said information signal, said bits being different in significance from each other, said system comprising memory means for storing said codewords in response to first clock pulses and including n memory units adapted to store said n bits of each of said codewords respectively and simultaneously, and means for respectively applying said n bits to said n memory units, said applying means including n first switching means for interchanging the assignments of said n bits to said n memory units.

4,181,915
LED CHANNEL NUMBER DISPLAY RESPONSIVE TO AMBIENT LIGHT LEVEL

William A. Lagoni, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,882
Int. Cl.[2] H04N *9/535, 5/58*
U.S. Cl. 358—27 **10 Claims**



1. In a television receiver including tuner means for processing RF signals received by the receiver in accordance with a selected channel to generate IF signals, signal processing means for processing said IF signals to generate luminance and color signals, and a kinescope for generating an image in response to said luminance and color signals, apparatus comprising:

channel number display means including a light emitting element for indicating the channel number of said selected channel;

power supplying means for coupling power to said light emitting element, the amount of power coupled to said light emitting element determining the photometric brightness of said light emitting element;

picture property determining means included in said signal processing means for determining at least one picture property directly related to the photometric brightness of said image produced by said kinescope; and

control means including an ambient light sensing element and a setting element for generating a control signal representing the ambient light level in the environment of said receiver and a desired condition of said picture property;

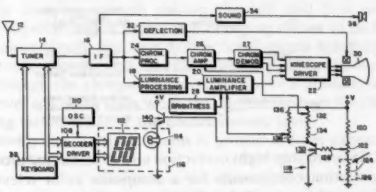
said control signal being coupled to both said picture property determining means and to said power supplying means to simultaneously control said picture property and the photometric brightness of said light emitting element in direct relationship to said ambient light level;

said power supplying means being responsive to said control signal to cause the attenuation of the photometric brightness of said light emitting element as perceived by a viewer with respect to the photometric brightness of said image as perceived by the viewer throughout the range of said control signal.

4,181,916
LIQUID CRYSTAL CHANNEL NUMBER DISPLAY RESPONSIVE TO AMBIENT LIGHT LEVEL

John G. N. Henderson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,883
Int. Cl.[2] H04N *9/535, 5/58*
U.S. Cl. 358—27 **8 Claims**



1. In a television receiver including tuner means for processing RF signals received by the receiver in accordance with a selected channel to generate IF signals, signal processing means for processing said IF signals to generate luminance and color signals, and a kinescope for generating an image in response to said luminance and color signals, apparatus comprising:

channel number display means including a display element for indicating the channel number of a selected channel, said element being normally illuminated by ambient light in the environment of said receiver;

a source of artificial light positioned with respect to said channel number display means to illuminate said display element;

power supplying means for coupling power to said source of artificial light, the amount of power coupled to said artificial light source determining the amount of light emitted by said light source;

picture property determining means included in said signal processing means for determining at least one picture property directly related to the photometric brightness of said image produced by said kinescope; and

control means including an ambient light sensing element

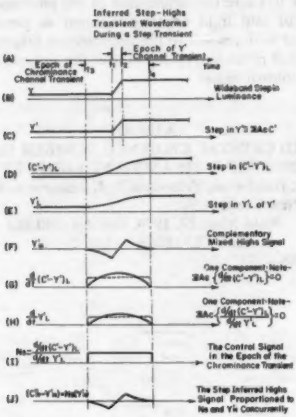
and a setting element for generating a control signal representing the ambient light level in the environment of said receiver and a desired condition of said picture property; said control signal being coupled to both said picture property determining means and to said power supplying means to control said picture property in direct relationship to said ambient light level and to control the light emitted by said artificial light source in inverse relationship to said ambient light level and in a predetermined relationship to said picture property.

4,181,917

COLOR TELEVISION RECEIVING SYSTEM UTILIZING INFERRED HIGH FREQUENCY SIGNAL COMPONENTS TO REDUCE COLOR INFIDELITIES IN REGIONS OF COLOR TRANSITIONS

Donald Richman, Huntington, N.Y., assignor to Quadricolor Technology L.P., Great Neck, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,228
Int. Cl.[2] H04N *5/21*
U.S. Cl. 358—36 **216 Claims**


Inferred Step-Highs Transient Waveforms During a Step Transient
Epoch of Chrominance Channel Transient
Epoch of Y' Channel Transient
time
Wideband Step in Luminance
Step in Y'≡ΔAcC'
Step in (C'-Y')L
Step in Y'L of Y'
Complementary Mixed Highs Signal
The Control Signal in the Epoch of the Chrominance Transient
The Step Inferred Highs Signal Proportioned to Na and Y'L Concurrently

182. Inferred step highs correction circuit means for processing correction components for a composite color television signal comprising a wide bandwidth monochrome video signal and a plurality of reduced bandwidth chrominance signals including associated reduced bandwidth primary color signals, wherein the absence of high frequency chrominance components can produce color or luminance display errors which are visible in regions of sharp color transitions, said correction circuit comprising:

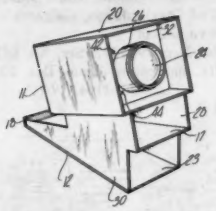
plural circuit means separately responsive to the high and low frequency components of the wideband monochrome signal and to the plural chrominance signals for processing for each of one or more reduced bandwidth chrominance signals respective inferred high frequency chrominance components which are substantially proportional in instantaneous value to the product of (1) a signal representative of the value of the high frequency portion of said wideband monochrome signal exceeding the bandwidth of said reduced bandwidth chrominance signal and (2) a signal representative of the time rate-of-change of said reduced bandwidth chrominance signal and (3) the inverse of a signal representative of the time rate-of-change of the low frequency portion of said wideband monochrome signal having a bandwidth comparable to the bandwidth of said reduced bandwidth chrominance signal.

4,181,918

TELEVISION RECEIVER PROJECTION SYSTEM

Robert E. Warman, 695 St. Clair, Grosse Pointe, Mich. 48230, and Cortland R. Dusseau, 1633 S. Cass Lake Rd., Keego Harbor, Mich. 48033

Filed Apr. 7, 1978, Ser. No. 894,574
Int. Cl.[2] H04N *5/74, 5/645, 5/72, 5/64*
U.S. Cl. 358—237 **3 Claims**



1. For use in combination with a television set having a conventional cathode ray tube with an exposed face surrounded by a forwardly protruding structural flange and a base of generally rectangular configuration which is normally disposed on a support surface:

a projection body comprising the substantially integral combination of a flat base member, means defining an inclined television set support surface above the flat base member and a projection enclosure having first and second longitudinally opposite open ends and disposed over a portion of the inclined support surface, one of the open ends being configured to receive and fit closely around the structural flange of the television set, and a lateral ridge on the means defining the inclined surface to receive and abut the base of the television set when placed on the inclined surface, the ridge being longitudinally spaced from the plane of the open end of the projection enclosure nearest the ridge such that the television set may be placed on the inclined surface with the face of the cathode ray tube projecting into the projection enclosure and the base abutting the ridge so as to secure the television set in the projection position without the use of fasteners, such as clamps or screws;

a lens system secured within the projection enclosure for projecting an image from the cathode ray tube surface onto a remote screen; and

switch means for connection with the vertical deflection plates of the cathode ray tube to invert the image of the television screen for projection through said lens system.

4,181,919

ADAPTIVE SYNCHRONIZING CIRCUIT FOR DECODING PHASE-ENCODED DATA

Grover G. Phillips, Jr., Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 28, 1978, Ser. No. 891,086
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—42 **14 Claims**

1. A circuit for providing a blanking pulse comprising:

a first means having first and second inputs and an output for producing a first state at said output in response to a first signal at said first input;

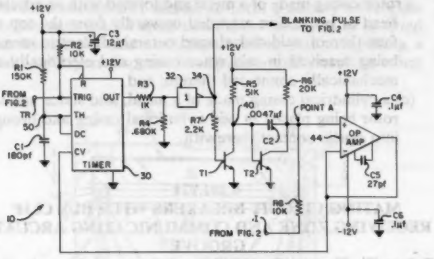
a second means for producing a second state at said output in response to a predetermined condition at said second input; and

circuit means operatively coupling said output with said second input whereby each of said first and second states is maintained at a relatively stable percentage of the time between successive first signals to said first input when the frequency of said first signals varies, with one of said first

and second states of said first means providing said blanking pulse;

said second means including means for producing an increasing voltage starting with a said first signal; and

said circuit means having a voltage reference point therein and a circuit path for producing a falling voltage level at said reference point in response to said first state; and



means operatively coupling said reference point with said second input whereby said first means is shifted to said second state when the falling voltage level at said second input equals the rising voltage produced by said second means.

4,181,920

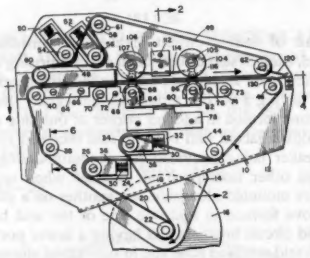
MAGNETIC TICKET ENCODING TRANSPORT

Allen Cerekas, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Mar. 27, 1978, Ser. No. 890,463

Int. Cl.[2] **C11B** *15/00;* **G06K** *7/08;* **C06K** *13/00;* **G11B** *21/22*

U.S. Cl. 360—88 **10 Claims**



1. A magnetic ticket encoding transport for transporting a ticket having opposite sides and a magnetic portion therebetween, comprising:

movable belt means including at least a pair of laterally spaced upper and a pair of laterally spaced lower aligned movable belts for gripping the opposite sides of said ticket and moving said ticket with said belt means,

said belts having an aligned space therebetween with the magnetic portion of the ticket moving in said aligned space,

means for moving said belts along a given path,

magnetic encoder means positioned in said path and in the aligned space for coacting with the magnetic portion of the ticket,

and pinch means for pinching said belts together at the magnetic encoder means and positioning the magnetic portion of the ticket for operative contact with the magnetic encoder means in movement of the ticket in the given path, and

alignment means for alignment of the ticket between said belts prior to reaching said encoder means along said path.

4,181,921

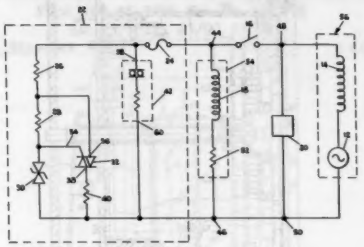
HARMONIC DISTORTION ATTENUATOR

Robert E. Taylor, Cadillac, and Paul J. Lee, Lake City, both of Mich., assignors to W. N. Phillips, Inc., Lake City, Mich.

Division of Ser. No. 760,379, Jan. 18, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,051

Int. Cl.[2] **H02H** *7/20, 3/20*

U.S. Cl. 361—56 **9 Claims**



1. In an electrical circuit having a pair of AC power supply lines with AC voltage generally at a first predetermined level therebetween, a harmonic distortion attenuator connected across the power supply lines and having a bidirectional voltage clamping means connected to one of the power supply lines and adapted to close responsive to a voltage above the predetermined level and a first power dissipation means connected in series with the bidirectional clamping means and to the other power supply line to dissipate power only when the voltage applied to the clamping means rises above a first voltage level, the attenuator being adapted to be connected to a voltage source which produces a first voltage level and across a load to suppress and dissipate transient voltage surges above the first voltage level, the improvement which comprises:

bidirectional means connected in parallel with the clamping means and in series with the first power dissipation means for shunting current passing through said first power dissipation means across said clamping means to said one power supply line, said bidirectional means being operative to pass current therethrough only when the current through the clamping means rises above a predetermined level and being open when the current through the clamping means is below the predetermined level;

whereby the clamping means is protected from excess current surges.

4,181,922

CIRCUIT INTERRUPTER WITH IMPROVED ADJUSTABLE TRIP UNIT

Joseph J. Matsko, Beaver; Alan B. Shimp, Monroeville, and Paul Skalka, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1977, Ser. No. 853,991

Int. Cl.[2] **H02H** *3/08;* **H01H** *77/02*

U.S. Cl. 361—115 **16 Claims**

1. A circuit interrupter comprising:

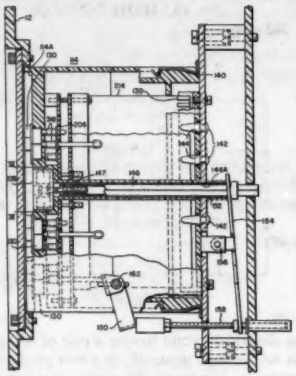
a housing,

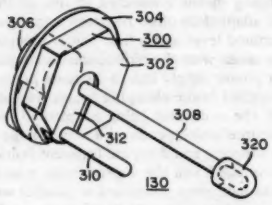
a circuit breaker mechanism supported within said housing and comprising separable contacts, an operating mechanism for moving said contacts between open and closed positions, and a releasable trip mechanism operable when actuated to automatically move said contacts to the open position;

means for sensing current flow through said contacts;

a trip unit comprising electronic circuit means connected to said sensing means and said trip mechanism for actuating said trip mechanism upon overcurrent conditions, said trip unit comprising means for adjusting circuit parameters thereof to specify conditions which will result in a tripping operation, said adjusting means comprising a short-

ing plug having a plurality of pins at least two of which are electrically connected together, said trip unit comprising a plurality of sockets adapted to receive said pins and a plurality of electronic circuit components connected to said sockets, the number of said sockets being greater than





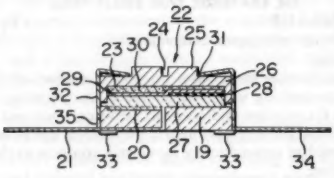
the number of said pins so that said shorting plug can be inserted in a plurality of positions, whereby insertion of said shorting plug into said sockets is operable to select desired electronic circuit components for operation in said trip unit.

4,181,923

CERAMIC TRIMMER CAPACITOR

Toshio Tatsumi, Daito; Tadashi Otani, Yao, and Masami Yamazi, all of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 17, 1978, Ser. No. 925,189
Claims priority, application Japan, Jul. 26, 1977, 52-90000
Int. Cl.[2] H01G *5/06*
U.S. Cl. 361—293 **5 Claims**



1. A ceramic trimmer capacitor characterized by the provision of

(a) a stator having a semicircular stator electrode on the upper surface thereof;

(b) a rotor comprising a disk-shaped ceramic dielectric member having a semicircular dielectric layer which is coated over the upper surface thereof and which has a dielectric constant less than 20 and a coefficient of thermal expansion substantially equal to that of said disk-shaped ceramic dielectric member and a rotor electrode overlaid over the whole upper surface of said disk-shaped ceramic dielectric member including said dielectric layer, and

a rotor casing made of a metal and formed with an adjusting head or projection extended upwardly from the top surface thereof, said disk-shaped ceramic dielectric member being received in said rotor casing and electrically and mechanically connected thereto; and

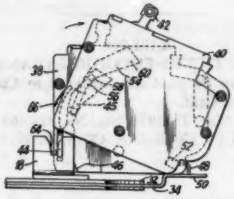
(c) a cylindrical casing made of a metal, said stator and said rotor being placed in said cylindrical casing and brought into elastic contact therewith.

4,181,924

MATING CIRCUIT BREAKERS WITH BUS CLIP RECEIVING ZONE AND COMMUNICATING ARCUATE GROOVE

Robert W. Thomas, Earlysville, and Steven F. Hovanic, Barboursville, both of Va., assignors to Arrow-Hart, Inc., Earlysville, Va.

Filed Jun. 7, 1978, Ser. No. 913,387
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—353 **5 Claims**



1. A pair of mating circuit breakers for installation in a panelboard, each of said circuit breakers comprising a housing, a bus clip mounted within said housing for attachment to a bus blade and having a portion extending outwardly therefrom, a recessed zone formed in a lower corner of one side of each of said housings adjacent said bus clip said recessed zone in one circuit breaker being provided for accommodating said bus clip of said other mating circuit breaker when said pair of breakers are mounted alongside one another on a panelboard, and a groove formed in said one side of the said housing of each of said circuit breakers and having a lower portion leading to each said recessed zone and in substantial alignment with the portion of each said recessed zone that is adapted to accommodate said bus clip of the other of said mating breakers when both of said circuit breakers are mounted adjacent one another on the panel board, each said groove being effective to receive and to permit said bus clip of the other of said mating breakers to pass directly between said recessed zone and said groove when one of said mating circuit breakers is pivoted relative to the other circuit breaker when the latter is mounted on the panelboard.

4,181,925

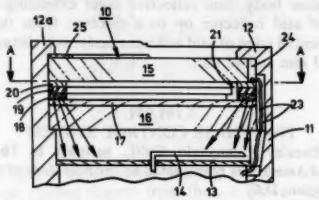
TRANSPARENT INSTRUMENT COVER AND INSTRUMENT INCORPORATING SAME

Kenneth Burrows, and Robert Hiscutt, both of Birmingham, England, assignors to Saunders-Roe Developments Limited, Hayes, England

Filed Jul. 18, 1977, Ser. No. 816,683
Claims priority, application United Kingdom, Jul. 19, 1976, 30039/76
Int. Cl.[2] G01D *11/28;* **F21V** *9/16*
U.S. Cl. 362—29 **8 Claims**

1. A transparent coverglass adapted to be fitted to an instru-

ment above a dial on the instrument to enable legends or characters on the dial to be viewed externally of the instrument, said coverglass comprising a pair of transparent laminates and an electroluminescent area sandwiched between the laminates, the electroluminescent area occupying a relatively small portion of the area between the transparent laminates to provide a viewing window through the major portion of the area, and transparent adhesive securing the laminates together with the electroluminescent area therein to form a unitary coverglass sandwich with spaced apart transparent laminates to be fitted to an instrument, said electroluminescent area comprising a plurality of layers disposed in adjacency and including a first



electrode layer of transparent electrically conductive metal oxide film, said first electrode layer being applied to an inner surface of one of said laminates, a layer of light emitting phosphor, an insulating layer and a second electrode layer, said second layer comprising a copper film applied to said insulating layer, and means for connecting said electroluminescent area to an electrical supply so that, when energised, light is projected from an inner surface of the coverglass to illuminate at least part of a dial of an instrument on which the coverglass is fitted through the inner one of said transparent laminates and the illuminated dial is viewable through both the inner and outer transparent laminates.

4,181,926

ILLUMINATING FIXTURE FOR SURGICAL LIGHT

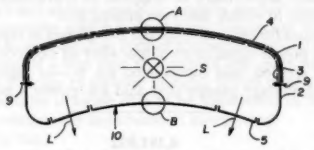
Dieter Kockott, Hanau am Main, and Joachim Bensel, Steinau, Fed. Rep. of Germany, assignors to Original Hanau Quartzlampen GmbH, Hanau am Main, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,352

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725428

Int. Cl.² A61G *13/00*

U.S. Cl. 362—33 **9 Claims**



1. Illuminating fixture enclosure adapted to contain a radiation source (S) emitting visible light and infrared radiation, particularly suitable for operating room purposes comprising

an upper enclosure section (1) and a lower enclosure section (2), heat insulated from each other,

said lower enclosure section (2) including means (5) for passing visible light from the inside of the enclosure to the outside thereof, said lower enclosure section having an inner infrared radiation reflecting surface for reflecting infrared radiation toward said upper enclosure section,

said upper enclosure section (1) having an inner infrared radiation absorbing surface (3) and an outer heat emitting surface (4) in heat conducting relationship with said inner infrared radiation absorbing surface,

whereby infrared radiation from the interior of the enclosure is absorbed by said upper enclosure section (1) and emitted at the outer heat-emitting surface thereof to reduce the amount of infrared radiation radiated from the lower enclosure section (2).

4,181,927

CANDLE HOLDER

John A. M. Garcia, 1818 Hancock St., Los Angeles, Calif. 90031

Filed Nov. 15, 1976, Ser. No. 741,970

Int. Cl.² F21V *35/00, 15/00*

U.S. Cl. 362—163 **5 Claims**

1. A candle holder for a candle comprising a container having fuel and a wick therein, said candle holder having a cover, said cover comprising:

a ring;

a chimney extending upward from said ring, said chimney having a plurality of holes spaced around its base;

a conical flange mounted on said ring and extending downward and outward therefrom;

a base assembly, the candle being mounted on said base assembly for holding the candle; and

holding means for detachable interconnection of said cover and said base assembly for detachably interconnecting said base assembly and said cover whereby the candle is detachably held between said base assembly and said cover, said holding means comprising a hole in said cover and a hole in said base assembly, a holding rod having a flange on one end thereof and being detachably engaged in one of said holes, the end of said holding rod opposite said flange extending through the other of said holes; a nut engaged on the end of said holding rod opposite said flange portion, said nut engaging adjacent said hold opposite said hold engaged by said flange so that tightening said nut tightens said cover with respect to said base assembly.

4,181,928

PORTABLE SPOT/FLOOD LIGHT

Thomas Zelina, Erie, Pa., assignor to Lighting Systems, Inc., Erie, Pa.

Filed Dec. 22, 1977, Ser. No. 863,574

Int. Cl.² F21L *1/00, 3/00, 7/00, 15/00*

U.S. Cl. 362—184 **6 Claims**

1. A combination flood light and spot light comprising,

an elongated, generally U-shaped body having first and second ends and an elongated lens forming one side of said body,

an elongated, concave reflector supported in said body between said lens and said body,

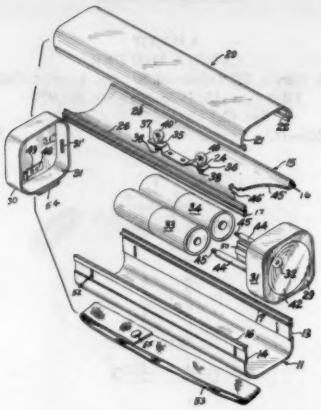
first end cap means and second end cap means,

said first end cap means supported on the first end of said body and said second end cap means supported on the second end of said body,

a first lamp means supported on said concave reflector,

a spot reflector supported on said second end cap means,

and a second lamp means supported on said second end cap means,
batteries in said body,

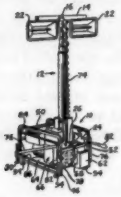


and means selectively connecting said battery to said first lamp and to said second lamp.

4,181,929
PORTABLE ILLUMINATING TOWER

Gerald L. Barber, and Wayne Comstock, both of Greenville, S.C., assignors to Venture Ride Mfg. Inc., Greer and High-Lite Corporation, Greenville, both of, S.C.

Filed Jan. 6, 1977, Ser. No. 757,389
Int. Cl.[2] F21L *13/06, 15/08;* **F21S** *3/10*
U.S. Cl. 362—192 **18 Claims**



1. A self-contained illuminating tower comprising:
a base frame,
a multiple section extensible column on said base frame moveable between lower retracted and upper extended positions, said column including at least an upper section and a lower section,
electric illuminating means mounted on the upper end of the upper section of said column,
electric generator means of said base frame adapted to supply power to said illuminating means,
actuating means on said base for extending said column, and
brace means connected to said base frame for bracing the tower when said column is extended, said brace means comprising a pair of arm members and means connecting said arm members to said base frame for enabling said arm members to be extended laterally outwardly from said base frame in bracing positions when said column is extended and to be retracted to compact storage positions in close proximity to said base frame when said tower is not in use.

4,181,930
LAMP REFLECTOR UNIT

Jan A. C. Mewissen, and Ferdinandus M. J. Van Beek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

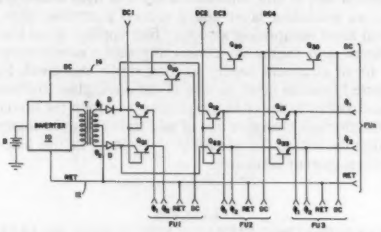
Filed Aug. 10, 1977, Ser. No. 823,401
Claims priority, application Netherlands, Aug. 23, 1976, 7609323
Int. Cl.[2] F21V *7/00, 1/22*
U.S. Cl. 362—296 **2 Claims**

1. A lamp reflector unit to be used for projection purposes and comprising a cup-shaped reflector body, said body having a reflective layer, an electrical light source disposed within said reflector body, said reflective layer extending over the interior of said reflector up to a distance from the largest circumferential edge of said reflector body, said distance being between 3 mm and 10 mm.

4,181,931
TWO-PHASE CONTROL SYSTEM

Dale L. Beezley, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1977, Ser. No. 861,148
Int. Cl.[2] H03K *17/56*
U.S. Cl. 363—4 **16 Claims**



6. A two-phase control system comprising:
(a) means for converting a d.c. potential source into an a.c. power signal;
(b) means for splitting said a.c. power signal into two phases separated by 180°, each of said two phases having a peak voltage less than that of said a.c. power signal;
(c) means for simultaneously switching each of said two phases sequentially in response to a plurality of control signals to enable said two phases; and
(d) means for recombining said two phases to reproduce said a.c. power signal as an output after all said control signals are applied, said reproduced a.c. power signal having a peak voltage greater than said a.c. power signal.

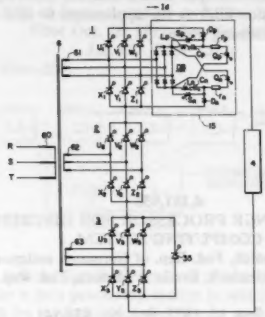
4,181,932
POWER CONVERTER

Masakatsu Fujiwara, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 20, 1977, Ser. No. 817,466
Claims priority, application Japan, Jul. 21, 1976, 51-86754
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—68 **9 Claims**

1. A power converter comprising a first converter unit and a second converter unit which are connected in series to each other at their output terminal sides and to which substantially equal a.c. input voltages are applied from an a.c. power source, the first converter unit being operated at a variable control angle within a range advancing in phase to the a.c. input voltage, and the second converter unit being operated at a variable control angle within a range lagging in phase to the a.c. input voltage, the improvement wherein at least one additional converter unit is connected at its output terminal side in series to

the first and second converter units, said additional converter unit being operated at a fixed control angle corresponding to a maximum forward conversion limit or a maximum reverse



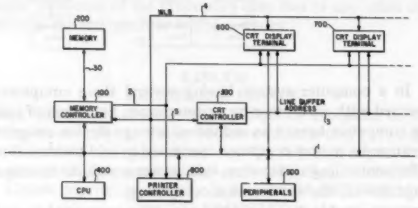
conversion limit within a range lagging in phase to the a.c. input voltage applied thereto from the a.c. power source, or being set in an outputless mode through bypassing means.

4,181,933

MEMORY ACCESS AND SHARING CONTROL SYSTEM

Bruce M. Benysek, Herkimer, N.Y., assignor to Mohawk Data Sciences Corp., Parsippany, N.J.

Filed Apr. 18, 1978, Ser. No. 897,410
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. In a system having a random access memory means with a number of addressable locations, a group of low priority memory users and at least one high priority memory user and a memory controller which is operatively connected with the memory means and which is further connected with all of said users by means of a first data and control bus, each memory user including means to provide memory access signals to the memory controller to cause data to be transferred to or from the memory means; the improvement comprising:

a second data bus;

means for signalling that the memory access signals provided by the high priority user require a block transfer operation involving multiple memory accesses for a block of data; and

the memory controller including:

a timing generator for generating a set of timing signals;

means responsive to said signalling means and to said timing signal set for generating a set of high priority timing signals including a high priority time signal which is periodic from the start to the completion of such a transfer of a block of data; and means responsive to the high priority time signal to access the

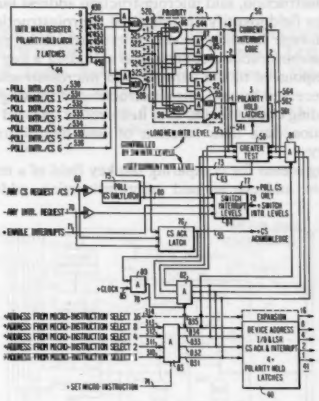
memory means with the memory access signals of the high priority memory user during one half of the period of the high priority time signal and to transfer the accessed data to the high priority memory user via the second data bus and to access the memory means with the memory access signals of the low priority memory users (1) during the other half of the period of the high priority time signal and (2) during such time that the high priority time signal is not periodic and to transfer the data so accessed to such low priority memory users via the first data and control bus.

4,181,934

MICROPROCESSOR ARCHITECTURE WITH INTEGRATED INTERRUPTS AND CYCLE STEALS PRIORITIZED CHANNEL

George B. Marenin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,193
Int. Cl.[2] G06F *3/04, 13/00*
U.S. Cl. 364—200 **16 Claims**



1. Apparatus for controlling a computing system to enable cycle stealing and interrupt operations, comprising:

common poll bus means including a plurality of communication lines actuatable by input/output devices selectively for signaling a plurality of cycle steal priority requests in parallel and interrupt requests; executable storage means for storing a plurality of priority addressable program subroutines selectively controlling said computing apparatus to process said interrupt requests;

interrupt mask means set by said computing system for selectively enabling and disabling interrupt requests;

interrupt gate means responsive to an interrupt request on said common poll bus means and to said interrupt mask means for signaling the presence of an allowed interrupt request on said poll bus means; and

priority encoder means selectively responsive to said interrupt gate means for switching execution to a new interrupt priority level subroutine and directly to said poll bus means for encoding the highest cycle steal priority signal.

4,181,935

DATA PROCESSOR WITH IMPROVED MICROPROGRAMMING

Walter E. Feeser, San Diego, Calif., and Mark L. C. Gerhold, Raleigh, N.C., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 2, 1977, Ser. No. 830,157
Int. Cl.[2] G06F *7/20, 7/28;* G05B *13/02*
U.S. Cl. 364—200 **13 Claims**

1. In a microprogrammed data processor in which data is processed using macroinstructions, each of which is in turn implemented by the execution of one or more mocroinstructions, the improvement comprising:

an addressable main memory for storing a plurality of mac-

roinstructions and a plurality of microinstructions for implementing said macroinstructions;

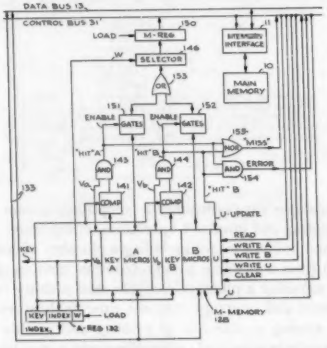
an addressable dynamically changable microinstruction memory having a fast access time and a smaller storage capacity relative to said main memory, said microinstruction memory providing for storing a plurality of microinstruction data items at individually addressable storage locations, each microinstruction data item containing one or more microinstructions and an associated key;

microinstruction output means for receiving a microinstruction accessed from said microinstruction memory;

microinstruction addressing means for receiving from said processor in response to a macroinstruction being executed a microinstruction address indicative of a requested microinstruction which it is desired be applied to said microinstruction output means for use in executing said macroinstruction, said microinstruction address including an index field identifying a selected microinstruction data item storage location in said microinstruction memory, said microinstruction address also including a key field;

means responsive to the index field a microinstruction address received by said microinstruction addressing means for reading out a selected data item from a selected microinstruction data item location of said microinstruction memory;

comparing means for comparing the key field of a microinstruction address in said microinstruction addressing



means with each key contained in a selected microinstruction data item read out from said microinstruction memory in response to the infex field of the microinstruction address in said microinstruction addressing means, said comparing means providing a "hit" signal in response to a successful comparison between said key field and only one key of a selected microinstruction data item read out from said microinstruction memory and said comparing means providing a "miss" signal when no successful comparison is obtained between said key field and any key of a selected microinstruction data item read from said microinstruction memory;

"hit" responsive means responsive to a "hit" signal produced by said comparing means for causing the requested microinstruction in the microinstruction data item whose selection produced the "hit" signal to be applied to said microinstruction output means;

"miss" responsive means responsive to a "miss" signal produced by said comparing means for employing the key field and index field of a microinstruction address in said microinstruction addressing means for which the "miss" signal was produced for obtaining from said main memory the requested microinstruction and for causing this requested microinstruction to be applied to said microinstruction output means, said "miss" responsive means also being operative in response to a "miss" signal to write the requested microinstruction and its associated key into the microinstruction data item storage location of said microinstruction memory for which a "miss" was produced; and

means for executing a microinstruction received by said microinstruction output means and for deriving a next microinstruction address for application to said microinstruction addressing means.

4,181,936

DATA EXCHANGE PROCESSOR FOR DISTRIBUTED COMPUTING SYSTEM

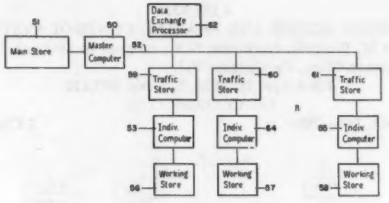
Rudolf Kober, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,541

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641741

Int. Cl.[2] G06F *15/16, 9/00*

U.S. Cl. 364—200 **4 Claims**



1. In a computer system having several slave computers connected with each other by a transmission line, each of said slave computers having an individual storage device assigned thereto, and a master computer connected to said transmission line for controlling said system, said master computer having a storage device, the combination comprising;

a programmable data exchange computer connected to said transmission line,

said data exchange computer being separate from said master computer and having an individual program storage device,

timing means for sequentially generating timing signals for each of three operational phases,

said master computer having means for responding to said timing signals during a control phase of said phases to cause said master computer to communicate with said slave computers the tasks they are to resolve in a subsequent phase,

said slave computers having means for responding to an autonomous phase of said phases to resolve the tasks transmitted to them simultaneously and independently from each other and independently of said master computer,

said slave computers having means for reporting to said master computer completion of execution by means of a stop-signal,

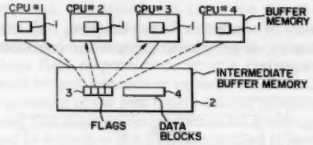
said data exchange computer having means for responding to said timing signals during an information transmission phase of said phases after one of said slave computers has emitted a stop-signal, for exchanging data between storage devices of the slave computers and the master computer,

said data being exchanged in accordance with programs stored in the program storage device of said data exchange computer.

4,181,937
DATA PROCESSING SYSTEM HAVING AN INTERMEDIATE BUFFER MEMORY

Akira Hattori, Yokohama, and Takamitsu Tsuchimoto, Machida, both of Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 28, 1977, Ser. No. 846,427
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—200 **5 Claims**

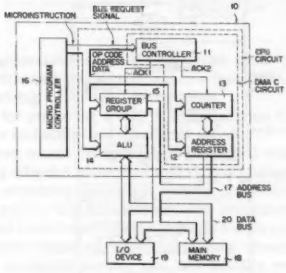


1. An intermediate buffer memory data block replacement system for a data processing system in which a main memory is shared by a plurality of processors, each having a buffer memory of its own, and having an intermediate buffer memory provided between the buffer memories of the processors and the main memory, and comprising a first means, operatively connected to said main memory and said plurality of processors, for enabling a data block transfer between the main memory and the buffer memories of the processors through the intermediate buffer memory and for storing copies of data blocks of the intermediate buffer memory in the buffer memories of the processors, said first means comprising replacing means for replacing one of the data blocks of the intermediate buffer memory with a data block of the main memory, said replacing means selecting as the data block to be replaced that data block having a smaller number of its copies stored in the buffer memories of the processors than that of any other data block in the intermediate buffer memory.

4,181,938
PROCESSOR DEVICE

Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 732,760, Oct. 15, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,989
Claims priority, application Japan, Oct. 15, 1975, 50-124152
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **8 Claims**

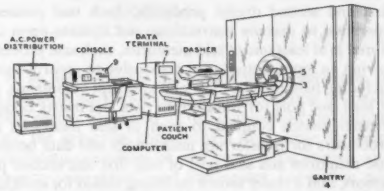


1. A processor device comprising a direct memory access controller utilizing a common memory bus for executing an operation of a direct memory access mode for gaining access to a main memory, a central processing unit utilizing said common memory bus for executing an operation of a microprogram-executing mode for gaining access to microprogram data stored in the main memory, and a microprogram controller connected to said direct memory access controller and said central processing unit for storing microprogram data to control the operation of the direct memory access controller and the central processing unit so that the microprogram controller will instruct the direct memory access controller and the central processing unit with respect to the execution of the operation of the direct memory access mode and microprogram-executing mode, the direct memory access controller, central processing unit and microprogram controller being integrated in a single semiconductor chip.

4,181,939
SCANNER DATA MULTIPLEXER FOR INTERFACING A RADIATION DETECTOR ARRAY AND A COMPUTER

Francis T. Lyons, Sudbury, Mass., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,015
Int. Cl.[2] G06F *9/20, 3/00, 75/42*
U.S. Cl. 364—200 **1 Claim**

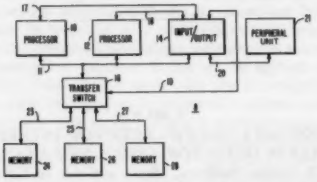


1. A device in combination with an array of a plurality of opposed pairs of radiation detectors, each of said detectors scanning across at least one half of a scan field in travelling along a sequence of resolution elements in a scan line, with the opposed detectors of each pair travelling in opposite directions across said scan field, said detectors, in a rotational sequence, providing scintillation count data through at least one pulse discriminating channel to an accumulator which, on a command from a general purpose computer under program control provides serial data words representative of data sequentially obtained from opposing detectors, said computer including a memory comprising a random access memory, and a buffer storage means having address locations, for each channel of said detectors, equal to the total number of resolution elements in a scan line, said device comprising input data register means for receiving said serial data words, base address register means for receiving from said computer a base address location corresponding to a location in the memory of said computer, means for transmitting appropriate commands from said computer to said accumulator and for transmitting said serial data words to said input data register, relative address means, including detector counter means, resolution element counter means, complement control means and adder means, said counter means, said complement control means and said adder means being interconnected for calculating a buffer memory relative address location for each said serial data word; absolute address register means for providing an absolute address by combining a base address from said base address register means and a relative address from said relative address means, and means for transferring said absolute address to said computer memory, said computer memory including means responsive to said absolute address for loading said buffer storage means for a channel of a given detector in a direction opposite to the buffer storage means for a channel of an opposed detector.

4,181,940
MULTIPROCESSOR FOR PROVIDING FAULT ISOLATION TEST UPON ITSELF

Thomas E. Underwood, Edgewater, and James J. Holden, III, Catonsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1978, Ser. No. 882,030
Int. Cl.[2] G06F *11/04*
U.S. Cl. 364—200 **9 Claims**



1. A multiprocessor system to facilitate fault isolation test upon one of its processors by another comprising:

a first, second, and third memory each having a plurality of memory address locations for storing a plurality of instructions and data;

a first and second digital processor, each said processor operative to execute instructions and operate upon data stored in at least one of said memories, each said processor having an input/output port responsive to control signals including halt, initiate, clear and interrupt commands, and at least one port for transferring data and instructions;

a transfer switch coupled to each of said memories and processors for transferring instructions and data between said memories and said port of said first and second processors, said transfer switch including means for switching said third memory in place of said first memory in response to a memory switching command signal and for causing said first memory at times when replaced by said third memory to be inaccessible by said first and second digital processors to protect the integrity of the information stored in said first memory;

said means for switching includes means for addressing said third memory by an address directed to said third memory and by an address directed to said first memory at times when replaced by said third memory,

said transfer switch including means for protecting the information in said second memory in response to a memory protection command signal while permitting information to be read from said second memory;

an input/output means coupled to said input/output port of said first and second processors for receiving, decoding and generating initiate, halt, clear and interrupt command signals and for receiving and decoding "who am I" identification request, memory switching and memory protection command signals, said input/output means coupled to a control input of said transfer switch for providing memory switching and memory protection command signals.

4,181,941
INTERRUPT SYSTEM AND METHOD

Ernest E. Godsey, 6641 Amahl Cir., Tucson, Ariz. 85704

Filed Mar. 27, 1978, Ser. No. 890,121
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **16 Claims**

1. A control system comprising in combination:

(a) a processor device for executing stored instructions;

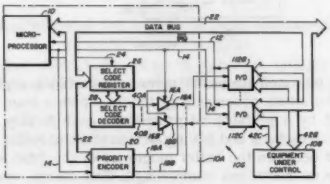
(b) a plurality of peripheral devices coupled to the processor device by means of a bus;

(c) an interrupt conductor connected to said processor device and each of said peripheral devices for conducting interrupt request signals from said peripheral devices, said processor device having means for producing acknowledge information in response to said interrupt request signals;

(d) an acknowledge conductor coupled to said processor device and each of said peripheral devices for conducting said acknowledge information to each of said peripheral devices;

(e) first means responsive to said acknowledge information and said interrupt request signals for enabling each of said interrupting peripheral devices to transmit a respective encode signal;

(f) a plurality of conductor means coupled, respectively, to said plurality of peripheral devices for conducting said encode signals;



(g) priority encoding means having a plurality of inputs coupled, respectively, to said conductor means and responsive to said encode signals for producing a code representing the identity of a highest priority one of said interrupting peripheral devices;

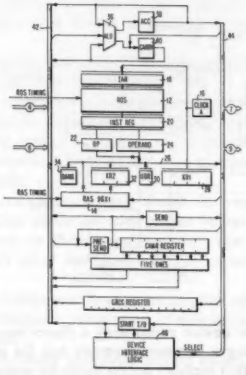
(h) means responsive to said code for producing a selection signal on the one of said conductor means connected to said highest priority interrupting peripheral device; and

(i) second means responsive to said selection signal for enabling said highest priority interrupting peripheral device to communicate with said bus.

4,181,942
PROGRAM BRANCHING METHOD AND APPARATUS

Richard G. Forster, and John K. Howard, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,243
Int. Cl.[2] G06F *9/12*
U.S. Cl. 364—200 **7 Claims**



1. A special branch instruction execution apparatus comprising:

a source of information comprised of a sequence of signals having first or second binary states;

a stored program processor, including addressable storage for program instructions, said instructions including a

special branch instruction having operation code and branch address fields;

first register means for storing information signals having first or second binary states for defining the branch mode;

second register means for storing information signals having a zero binary state or information signals having a non-zero binary state for specifying the number of passes through a loop; and

instruction execution means for executing the special branch instruction, said instruction execution means comprising means for generating a first signal to unconditionally branch to the address specified in said instruction branch address field responsive to sensing the presence of said special branch instruction operation code and to sensing the presence of the first binary state of information signals in said first register means; means for generating a second signal to branch to the address specified in said instruction branch address field and to decrement the stored information signals in said second register means responsive to sensing the presence of said special branch instruction operation code, responsive to sensing the second binary state of information signals in said first register means and responsive to sensing said non-zero binary state of information signals in said second register means; and means for generating a third signal to not branch responsive to sensing the presence of said special branch instruction operation code, responsive to sensing the second binary state of information signals in said first register means and responsive to sensing a zero binary state of information signals in said second register means.

4,181,943

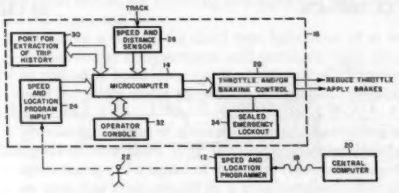
SPEED CONTROL DEVICE FOR TRAINS

Lloyd I. Mercer, Sr., 211 Englewood, Lufkin, Tex. 75901, and Steven B. Hugg, P.O. Drawer 28510, San Antonio, Tex. 78284

Filed May 22, 1978, Ser. No. 908,097

Int. Cl.[2] G06F *15/48;* **B61L** *3/00*

U.S. Cl. 364—426 **20 Claims**



1. An apparatus for limiting maximum speed of a train having a throttle and brakes pursuant to a train order, said apparatus comprising:

means for preparing a non-volatile program from said train order including said maximum speeds;

computer means on board said train, said computer means being adapted to receive said non-volatile program from said preparing means into volatile and non-volatile memory means, trip history from said computer means being stored in said non-volatile memory means and said volatile memory means providing temporary memory storage for said computer means, said non-volatile memory means restoring said volatile memory upon loss of memory during a trip;

sensor means for detecting speed and location of said train and feeding said speed and location to said computer means;

comparison means in said computer means for comparing said non-volatile program with said speed and location from said sensor means and generating an overspeed signal if said maximum speed has been exceeded;

control means operated by said overspeed signal to reduce speed of said train to less than said maximum speed and updating means in said computer means for changing location indication of said train in said volatile memory in response to known location indicators.

4,181,944

APPARATUS FOR ENGINE CONTROL

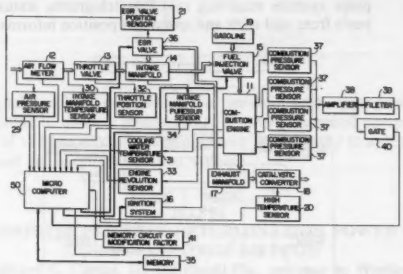
Teruo Yamauchi; Yoshishige Oyama, both of Katsuta, and Nobuaki Miyakawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 14, 1978, Ser. No. 924,819

Claims priority, application Japan, Jul. 15, 1977, 52/84096

Int. Cl.[2] G06F *15/20;* **F02D** *5/00*

U.S. Cl. 364—431 **14 Claims**



1. In an apparatus for the control of a combustion engine with a control device for controlling the process of converting the heat energy generated by fuel combustion into mechanical energy, the apparatus comprising a first sensor for detecting the operating conditions of said combustion engine operated for energy conversion, said first sensor converting said detected value into an electrical signal and producing said electrical signal; a memory storing a setting for controlling said control device and having the stored data capable of being updated in response to an input signal thereto; and a microcomputer for retrieving the setting for controlling said control device, from said first sensor and said memory, comparing the detected value of said first sensor with the setting for controlling said control device, calculating a setting for the optimum control of said control device in accordance with the operating condition of the combustion engine, and applying the result of said calculation to said control device; the improvement further comprising;

(a) a sensor for detecting the change with time of the combustion engine; and

(b) a modification factor memory circuit for determining the ratio between a previously detected value of said sensor for detecting the change with time of the combustion engine and the presently detected value thereof, said memory circuit calculating a modification factor associated with said ratio from a function determined in advance, said memory circuit applying to said memory the calculated value of said modification factor and data in said memory as a new setting.

4,181,945

HIGH-RELIABILITY VEHICLE CONTROL SYSTEM

Reinhard Adler, Althengstett, Fed. Rep. of Germany, and Henri Maatje, Oslo, Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,726

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701925

Int. Cl.[2] B61L *27/00;* **G06F** *15/50*

U.S. Cl. 364—436 **7 Claims**

1. A vehicle control system comprising:

at least one control center having

a first computer system capable of generating first control

data telegrams and responding to second control data telegrams; and

a plurality of track-bound vehicles each having

on-board control equipment in two-way communication with said first computer system to receive said first telegrams and to transmit said second telegrams;

said equipment including

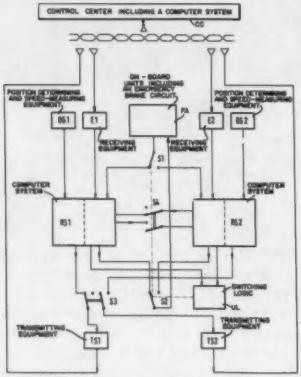
first means to receive said first telegrams,

second means to transmit said second telegrams,

on-board units to be controlled,

third means to determine the speed and position of an associated one of said vehicles,

two identical computer systems each coupled to said first, second and third means and said units, said two computer systems receiving said first telegrams, status reports from said units and speed and position information



from said third means to generate said second telegrams and to control said units in response to said first telegrams, and

switching logic coupled to each of said two computer systems, said units and said second means responsive to a first output signal of one of said two computer systems selected by said first telegrams for control of said units and for delivery of said second telegrams to couple said second telegrams from said selected one of said two computer systems to said second means for transmission, to couple a second output signal of said selected one of said two computer systems to said units for control thereof, and to enable said first computer system to check the operation of each of said two computer systems by means of information contained in said second telegram.

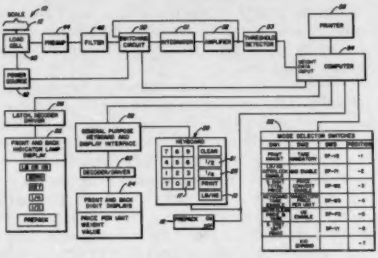
4,181,946

DIGITAL SCALE

Richard C. Loshbough, and Edward G. Pryor, both of Westerville, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 25, 1977, Ser. No. 828,041
Int. Cl.[2] G01G *19/413;* **G06F** *15/20*
U.S. Cl. 364—466 **19 Claims**

1. Digital weight measuring apparatus comprising, in combination, scale apparatus, generating means connected to said scale apparatus for generating digital signals representing the weight on said scale apparatus, digital weight display apparatus, control means interconnected with said generating means and with said digital weight display apparatus to control the digital weight display apparatus to display the weight on the scale apparatus, switch means interconnected with the control means operable with a weight on the scale apparatus to change the weight on the scale displayed by said digital weight display apparatus in pounds to the weight on the scale apparatus displayed by said digital weight display apparatus in kilograms, storage means for storing a tare weight, means responsive to operation of the switch means to convert the stored tare



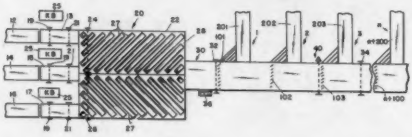
weight from pounds to kilograms, and means to subtract the converted tare weight from a gross weight on the scale apparatus.

4,181,947

CONVEYOR SORTING SYSTEM

Dale A. Krauss, and Robin L. Chang, both of Grand Rapids, Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Filed May 23, 1978, Ser. No. 908,999
Int. Cl.[2] G06F *15/20;* **B65G** *43/00*
U.S. Cl. 364—478 **28 Claims**



1. In a sorting conveyor system for articles, said system including a control circuit providing signals to diverter mechanisms in response to comparison of signals representing the distance the articles travel from a reference location to a selected divert location and operator assigned divert location information, the improvement comprising a training system for providing reference signals representing the distance articles travel from a reference location near an entry point of articles on the conveyor to each divert location, said training system comprising:

a source of signals representative of conveyor movement;

a first detector positioned near an entry point of articles onto the sorting conveyor;

a second detector movably positionable along the conveyor; and

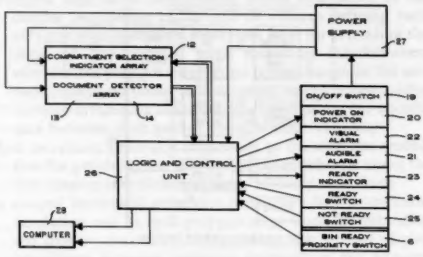
electrical circuit means coupled to said source and said first and second detectors for storing signals from said source representative of the distance an article travels between said first and second detectors for different locations of said second detector thus providing stored reference information which can subsequently be employed by the control circuit to control the diverting of articles based upon said stored information.

4,181,948

COMPUTER DIRECTED MANUAL SORTING AID

William A. Jackson, Lewisville, and Hubert C. Jones, Jr., Austin, both of Tex., assignors to Electronic Data Systems Corporation, Dallas, Tex.

Filed Jun. 6, 1977, Ser. No. 803,862
Int. Cl.[2] G06F *15/24;* B07C *5/10*
U.S. Cl. 364—478 **23 Claims**



1. A device for assisting in the manual sorting of items having distinguishing identifiers thereon, said identifiers differing amongst said items, said device comprising:

a. a plurality of compartments, each having an opening and the capability of holding a plurality of said items;

b. detecting means, coupled to said compartments and located in proximity to said openings of said compartments, for, when an item is placed in one of said compartments, providing a signal of a first type indicative of which of said compartments said item is placed in;

c. input means for receiving information relative to the identifier of an item and providing a signal of a second type indicative of said identifier;

d. directing means, coupled to said detecting means and to said input means, for receiving said signals of said first and second types and for:

1. providing a signal of a third type indicative of at least one particular compartment said particular item should be placed in upon the receipt of a signal of said second type indicative of the particular identifier of a particular item; and

2. providing a signal of a fourth type after providing said signal of said third type for said particular item and upon receipt of a signal of said first type indicating that an item has been placed in a compartment other than said particular compartment before an item has been placed in said particular compartment;

e. indicating means, coupled to said directing means, for receiving said signal of said third type and, upon receipt of said signal of said third type, providing a particular indication detectable by a person of said particular compartment into which said particular item should be placed; and

f. warning means, coupled to said directing means, for receiving said signal of said fourth type and, upon receipt of said signal of said fourth type, producing a warning detectable by a person.

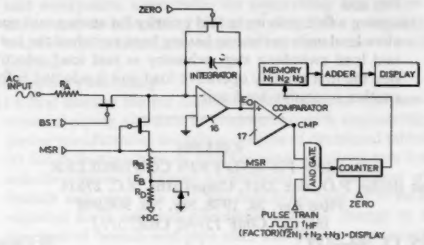
4,181,949

METHOD OF AND APPARATUS FOR PHASE-SENSITIVE DETECTION

Henry P. Hall, Concord, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Mar. 24, 1978, Ser. No. 889,654
Int. Cl.[2] H03K *13/17*
U.S. Cl. 364—487 **11 Claims**

1. A method of phase-sensitive detection of an input AC signal, that comprises, generating an approximate sine-wave sampling waveform by successively integrating the input signal over each of at least three measurement time intervals each of 180° duration and successively 45° phase-displaced; converting each of the three resulting measurements after it is made to



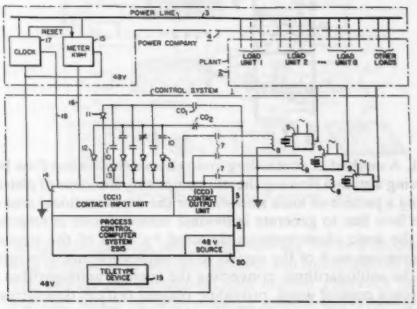
a digital number; and adding the numbers with appropriate weighting to obtain a measurement of the fundamental component of voltage of the input signal with insensitivity to at least 3rd and 5th harmonics of that voltage.

4,181,950

ADAPTIVE PRIORITY DETERMINATION POWER DEMAND CONTROL METHOD

Woodward C. Carter, II, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1977, Ser. No. 838,334
Int. Cl.[2] H02J *3/14;* G06F *15/56*
U.S. Cl. 364—492 **7 Claims**



1. A method of controlling the interruptible loads of a plant facility with a power demand controller assigning a demand limit to energy consumption, where said plant facility includes as said interruptible loads at least two load units of production having when operative a changing characteristic of power consumption from an individual starting time to an individual end time to provide respective production outputs; with said method comprising the steps of:

deriving a representation of the total amount of energy accumulated by said plant facility during a control period and of the current power drawn in said plant for predicting a demand at the end of said control period;

relating said predicted demand to said assigned demand limit for providing a demand error relative to said demand limit at the end of the control period;

selecting loads for switching into one of an ON and an OFF status according to a priority list based on one of the actual ON and OFF status of said loads and the individual power consumption thereof and according to said demand error to minimize the same;

switching a selected load and changing one of the actual ON and OFF status thereof in said priority list;

measuring the individual power consumption of each of said operative load units;

associating the measured individual power consumption with a corresponding operative load unit in said priority list; and

assigning a first priority in said priority list among said operative load units to the one having been switched the last in said load switching step, whereby in said load selecting step the first priority operative load unit is selected before another operative load unit.

4,181,951

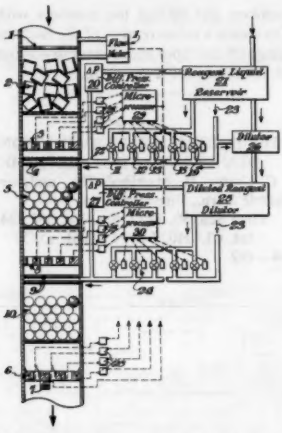
IN-LINE PH AND PION CONTROLLER

Jan Boeke, P.O. Box 2327, Chapel Hill, N.C. 27514

Filed Apr. 28, 1978, Ser. No. 900,908

Int. Cl.[2] G06F *15/46*; C02C *5/12*

U.S. Cl. 364—499 **20 Claims**



1. A method of controlling ionic characteristics in a flow line having a stream flowing therein comprising the steps of distributing a pattern of ionic sensors over the cross-sectional area of the flow line to generate individual sensor signals in response to the ionic characteristics detected by each of the sensors, converting each of the signals to its antilogarithms, averaging all the antilogarithms, converting the average antilogarithm to a binary control word, providing reagent orifices downstream of the sensors in a pattern distributed across the cross section of the flow stream, controlling the release of the reagent to the orifices from individual reagent dispensers in accordance with the binary control word, and mixing the flow stream downstream of the reagent orifices to homogenize it.

4,181,952

METHOD AND MEANS FOR MINIMIZING ERROR BETWEEN THE MANUAL DIGITIZING OF POINTS AND THE ACTUAL LOCATION OF SAID POINTS ON AN ELECTRONIC DATA ENTRY SURFACE

Richard G. Casey; Glen G. Langdon, Jr., both of San Jose; Patrick E. Mantey, Los Gatos, and Robin Williams, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,150

Int. Cl.[2] G08C *21/00*

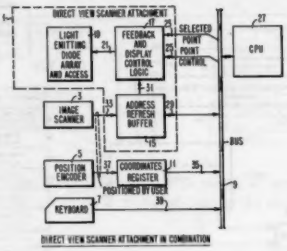
U.S. Cl. 364—515 **9 Claims**

5. In an apparatus for improving the positional accuracy of an operator controlled cursor engaged in the digitized encoding of graphic information on an electronic data entry surface, said cursor being formed from a position encoder; means for registering the coordinates of the initial contact position of the encoder of the surfaces; and an image scanner, the image scanner generating a coded array of data points of a corresponding part of the surface area inclusive of a locus of points defining a geometrical feature; the apparatus further comprising in combination:

a display;

a calculating element;

means including the position encoder registration means coupling the scanner for actuating the display with the



scanned and for transmitting said array data to the calculating element;

the calculating element being responsive to said data for computing the coordinates of the geometrical feature embedded in said data point array of contiguous points having the same preselected coded value; and

means including the calculating element for causing the display means to differentially indicate the location of the geometrical feature.

4,181,953

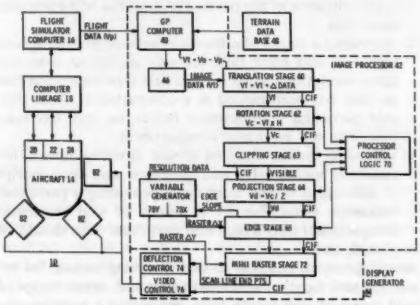
FACE VERTEX CORRECTION FOR REAL-TIME SIMULATION OF A POLYGON FACE OBJECT SYSTEM

Raymond C. Osofsky, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,639

Int. Cl.[2] G06F *15/20*; G09B *9/08*; H04N *7/18*

U.S. Cl. 364—515 **9 Claims**



1. An image data system responsive to observer data and responsive to polygon data from an object system of polygon faces, the polygon vertices being positionally defined at the resolution of the object system, the image data adapted to be displayed on a raster type display device which employs a separate miniraster of spaced scan lines for each polygon face at a scan line resolution which is equal to or less than the object system resolution for providing a display of a perspective image of the object system as viewed by an observer, in which the mismatch between the polygon vertex display position and the scan line display position created by the difference between the object system resolution and the scan line resolution is accommodated, comprising:

an object system data means for providing the object system coordinates at the object system resolution of each polygon vertex defining the polygon faces, and for establishing the scan line resolution of the miniraster;

image processor means for receiving the observer data and the object system coordinates for providing a first display coordinate and a second display coordinate for each polygon vertex which maintains the perspective relationships among the polygon vertices as viewed by the observer;

polygon edge slope determining means responsive to the display coordinates of the pair of vertices defining each polygon edge within each polygon face, for providing the slope of the polygon edge extending therebetween, wherein the polygon edge slope is the change in the second display coordinate between each pair of polygon edge vertices divided by the change in the first display coordinate between each pair of polygon edge vertices;

first increment generator responsive to the scan line resolution for providing the display increment change along the first display coordinate between adjacent scan lines;

a second increment generator responsive to the scan line resolution and to each polygon edge slope for providing the display increment change along the second display coordinate between endpoint positions of the adjacent scan lines required to display that polygon edge;

miniraster generation means responsive to the display coordinates of the polygon vertices of each polygon face and to the increment generators for providing the display coordinates of the scan line endpoints within the miniraster required to display each polygon face;

polygon corner correction means responsive to the display coordinates of each polygon vertex and to the increment generators, for defining the display coordinates of the scan line endpoint immediately subsequent to each vertex in terms of the display coordinates of that vertex by correcting the first increment and the second increment of the scan line end point immediately subsequent to each vertex; and

display generator means responsive to the end point display coordinates of each scan line for providing the deflection signals required to generate the miniraster of spaced scan lines for each polygon face.

4,181,954

COMPUTER-AIDED GRAPHICS SYSTEM INCLUDING A COMPUTERIZED MATERIAL CONTROL SYSTEM AND METHOD OF USING SAME

Leo Rosenthal, San Francisco; Leonard M. Isaacson, Tiburon, and John A. Ziebarth, Burlingame, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 144,951, May 19, 1971, abandoned, and a continuation-in-part of Ser. No. 134,389, Apr. 15, 1971, abandoned. This application Nov. 2, 1973, Ser. No. 412,527

Int. Cl.[2] G06F *15/56*

U.S. Cl. 364—520 **7 Claims**

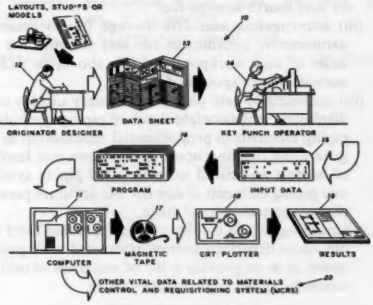
1. A graphical system for producing in a plane having two-dimensional pipeline coordinate axes, a planar axonometric representation of a three-dimensional pipeline in which material and non-material piping elements of said pipeline are associated with a multibit digital code representative of a series of workpoints compatible for use within a digital computer system, said workpoints being paired into overlapping sets, each set containing a dominant and subservient point having known relative three-dimensional coordinates, each subservient point having known coordinates X_{i+1}, Y_{i+1}, and Z_{i+1}, with respect to intersecting axes X, Y and Z, and being identified in relative three-dimensional coordinates by a distance (d) between it and the dominant point and values of two angles of a straight line intersecting them as related to orthogonal planes of reference through said dominant point, each dominant point having known three-dimensional coordinates X_i, Y_i, Z_i, said planar representation being produced in conjunction with said digital computer system, comprising

a memory for storing graphic and piping information about said pipline as machine readable data words or portions of words, a processor for combining, comparing and sorting said data words so as to indicate spatially selective relationships between said piping elements as a function of said workpoints, a controller for supervising said processor as well as controlling a display plotter for producing said two-dimensional, axonometric representation of said pipline,

said memory including

(1) a first storage file for classifying said material and non-material piping elements in conjunction with engineering piping specifications including subfiles of decisional tables (i) for indicating branch reinforcement requirements for selective types of piping connections as a function of branch and pipe size and for indicating type of branch required for a selected directional angular change as a function of branch and pipe size, and (ii) for associating additional sort and decisional tables indexed as a function of depicted and coded piping elements with proper material item numbers based on pipe size, or a simplified functional multibit subcode,

(2) a second storage file of generalized sort and decisional tables for indicating as a multibit binary display code, dimensions of said piping elements associated with said workpoint digital code required to correctly display each piping element as a standard piping symbol, in prespective, at said display plotter, said generated display code



being indexed from said second storage file as a function of a material item number stored in and indexed from said first storage file through an item number reference table subcode which includes drawing symbol and connection type minicodes for controlling selected dimensional tables and subroutines required to accurately and correctly display, in prespective, said piping symbols as well as present drafting notes and annotated leaders at said plotter,

(3) a third storage file of material item numbers indexed to material item short description terms in a format suitable for providing a list of materials in association with said planar representation of said pipeline at said display plotter,

(4) a fourth storage file of decisional and sort tables for indicating relative three-dimensional coordinates of said subsurvient and dominant workpoints as well as auxiliary workpoints whose coordinates were previously defined, as a function of distance (d) between adjacent workpoints b as well as angles β and α, previously defined, in accordance with

$$d=\sqrt{(X_{i+1}-X_i)^2+(Y_{i+1}-Y_i)^2+(Z_{i+1}-Z_i)^2} \quad (1)$$

and projection(s) of d onto said horizontal plane is $d_{horiz.}=d \cdot \text{Cos}\,\beta$ where β is the included angle in the vertical plane of reference,

$$(Z_{i+1}-Z_i)=d \text{ Sin } \beta, \quad (2)$$

$$(X_{i+1}-X_i)=d \cos \beta \cdot \cos \alpha$$

where α is the included angle in the horizontal plane of reference,

$$(Y_{i+1}-Y_i)=d \cdot \cos \beta \cdot \sin \alpha$$

with respect to a base location having known coordinates, with said planar representation as seen from an eyepoint located at a selected coordinate position in said three-dimensional system when the observer is looking toward said series of workpoints, and

(5) a fifth storage file of decisional and sort tables for converting relative and absolute three-dimensional coordinates of said fourth storage file to two-dimensional axonometric coordinates for aiding in converting said piping symbols to a correct representation at said plotter,

said controller directing and supervising operations of said processor and said plotter to provide a planar representation of said 3-d pipeline, being further characterized by operations which include

(i) locating in said field storage file for each piping element, a material items number as well as locating in said second storage file said binary display code indexed by material item number for indicating all dimensions associated with display of each of said piping symbol associated with corresponding piping elements,

(ii) determining all three-dimensional coordinates for each of said workpoints using said decisional and sort tables of said fourth storage file,

(iii) interrogating said fifth storage file to generate 2-d axonometric coordinates for said selected 3-d coordinates of said workpoints of (ii), above, as well as for associated workpoints, if any

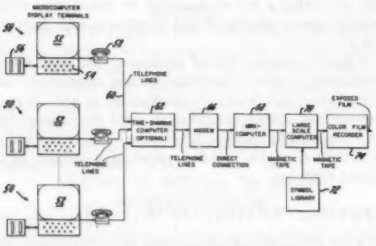
(iv) accessing to said plotter said binary display code for displaying said associate standard piping symbols of said piping elements in proper spatial relationship as well as generating drafting notes, center lines and leader lines of interest associated with depicted piping symbols, of said piping elements in correct and accurate perspective planar representational form,

(v) indexing to said display plotter from said third storage file, short descriptive terms associated with piping elements so as to provide a list of materials of said piping elements, as depicted at said plotter.

4,181,955
APPARATUS FOR PRODUCING PHOTOGRAPHIC SLIDES

Phillip S. Mittelman, Somers; Leon Malin, Port Chester, and John K. Heyl, Shrub Oak, all of N.Y., assignors to Mathematical Applications Group, Inc., Elmsford, N.Y.

Filed Jun. 2, 1978, Ser. No. 911,802
Int. Cl.[2] G06K *15/18*
U.S. Cl. 364—521 **58 Claims**



1. Apparatus for automatically generating photographic pictures, such as 35 mm slides, comprising:

a plurality of micro-computer terminals, each with a color display and input means for enabling the user to enter data, said terminals being programmed to generate information defining a plurality of standard graphical representations having certain variable characteristics, a particular one of said standard graphical representations including its characteristics being entered by users through the input means as answers to questions presented by the terminals, the color displays being capable of creating terminal color pictures of the particular graphical representations based on the user's answers, the terminals also being capable of modifying the variable characteristics of the particular graphical representations in response to user entries which change the answers to said questions so as to create final answers;

means for transmitting data representing the final answers from said terminals to a location remote from said terminals;

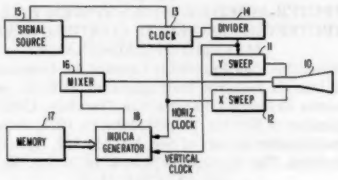
a central computer at a location remote from said terminals and receiving the data from said means for transmitting data, said central computer being programmed to generate data defining the raster points for computer pictures of the particular graphical representations based on the data representing the final answers, said computer pictures having enhanced resolution over the terminal pictures generated and displayed by the terminals, and

picture producing means for creating photographic pictures from the higher resolution raster point data generated by the central computer.

4,181,956
DIGITAL INDICIA GENERATOR EMPLOYING COMPRESSED DATA

Carl E. Schwab, Huntington Station, and David P. Rost, Malverne, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 7, 1977, Ser. No. 849,143
Int. Cl.[2] G06F *3/14, 15/20*
U.S. Cl. 364—521 **18 Claims**



1. In a display system for displaying signals representing an environment external thereto, said display system including a CRT display with a deflection means for sweeping a cathode ray beam over said CRT display in a predetermined pattern with means for controlling unblanking of said beam for creating visible manifestations on said CRT display, an indicia generator for providing signals to said means for controlling unblanking of said beam to write indicia on said CRT display concurrently with manifestations of said environmental signals and coordinated therewith in which said indicia generator is driven by data in compressed form comprising:

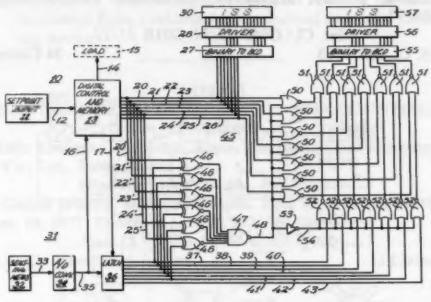
storage means for storing parameters related to said indicia including coordinates of a point on said indicia, a slope for said indicia and a length for said indicia, and

first means responsive to said stored parameters and to beam position in said pattern for producing signals to control unblanking of said beam to write indicia corresponding to said stored parameters.

4,181,957
MEANS FOR CORRELATION OF DIGITAL DISPLAY OF A SETPOINT AND AN ACTUAL CONTROLLED VALUE

B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1978, Ser. No. 892,057
Int. Cl.[2] G01K 7/14
U.S. Cl. 364—557 8 Claims

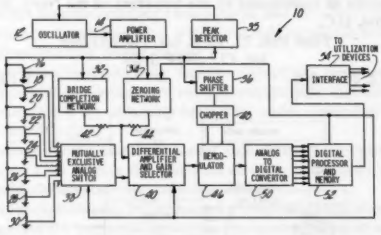


1. A digital display arrangement adapted to display a digital setpoint for a condition control system and further adapted to display a digital response for said condition control system, including: digital setpoint means having digital setpoint input means for selecting a setpoint for said condition control system; digital display means connected to said digital setpoint means to display said setpoint; condition responsive means having a condition responsive digital output; said digital display means connected to said condition responsive means to display the status of said condition control system; and comparator means for comparing said digital setpoint with said condition responsive digital output wherein said comparator means causes said digital display means to display only said setpoint when said setpoint and said condition responsive means are within a preselected range.

4,181,958
MULTIPLE PROBE GAGE SYSTEM

Richard O. Juengel, Romeo, and Kenneth J. Cook, Troy, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Filed Apr. 21, 1978, Ser. No. 898,831
Int. Cl.[2] G01B 7/12
U.S. Cl. 364—560 10 Claims

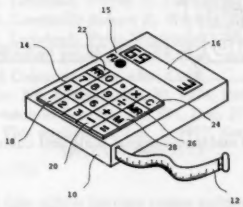


1. A multiple probe gaging system for producing output signals related to the dimensions of a workpiece comprising:
sensing means including a plurality of probe transducers for contacting a workpiece, each operative to generate an analog electrical signal as a function of the position of said workpiece relative to each said transducer;
convertor means having an input and an output, operative to transform analog electrical signals presented to said input into digital signals at said output;
switch means coupled between said sensing means and said convertor means input;
digital computing means and memory means coupled between said convertor means output and a control input of said switch means, operative to automatically actuate said switch means to selectively couple the analog electrical signal of particular probes to said convertor means input in accordance with a stored program in said memory, said digital computing means being further operative to store said digital signals generated at said convertor means output at predetermined locations in said memory means and to process said digital signals to produce system output signals which are a function of a plurality of said digital signals stored at said predetermined locations in accordance with said program in the memory, wherein said system operation may be adapted to gage various types of workpieces by changing the program in the memory.

4,181,959
STORED INFORMATION TRANSFERABLE MEANS FOR A COMBINED ELECTRONIC DIGITAL SCALE AND CALCULATOR

Iwao Tateishi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 23, 1977, Ser. No. 854,206
Claims priority, application Japan, Nov. 30, 1976, 51-162404[U]; Dec. 3, 1976, 51-163001[U]
Int. Cl.[2] G01B 3/08; G06F 7/38
U.S. Cl. 364—562 26 Claims



1. An electronic digital scale comprising:
a housing;
an extensible member adapted to be pulled in and out of the housing to fit an object to be measured;
a spring loaded reel means for accommodating and storing the extensible member therein and rotating in response to the extension of said member with respect to said housing;
a detector means directly coupled to the spring loaded reel means for detecting the rotations of the spring loaded reel means and providing output signals in response to said rotation representative of the extended length of said extensible member;
memory means having a plurality of addresses for receiving said output signals from the detector and storing the said output signals therein;
a display means for receiving stored output signals from said memory means and said output signals from said detector means;
a memory key means for causing the said output signals from said detector means to be stored in said memory means in a selected address;
a memory recall key means for transferring the said stored detector output signals from said memory means to said display means;
a memory clear key means for cancelling the said stored output signals from said memory means; and
memory control means interconnected with said memory

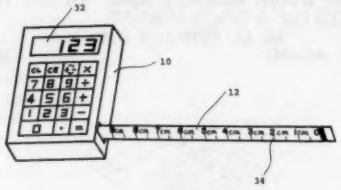
means and said memory key and memory recall key means responsive to a predetermined number of sequential actuations of said memory key means and said memory recall key means to store and display information, respectively, at and from a selected memory address.

4,181,960

TAPE REEL AND DETECTOR ASSEMBLY FOR AN ELECTRONIC COMBINED DIGITAL SCALE AND CALCULATOR

Iwao Tateishi, Yamatokoriyama, and Nobuyasu Kakutani, Yao, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 23, 1977, Ser. No. 854,213
Claims priority, application Japan, Nov. 29, 1976, 51-145456
Int. Cl.[2] G01B *3/08;* G06F *7/38*
U.S. Cl. 364—562 **18 Claims**



1. A combined electronic digital scale and calculator comprising:

a housing:

an extensible member means secured within said housing for determining a dimension of an object to be measured, said extensible member means having a predetermined total length and thickness, said total length being equal to the sum of the distance that the extensible member extends from said housing and the length of said extensible member remaining within said housing;

reel means having a predetermined radius, said reel means having said extensible member means wound thereon for accommodating and storing said extensible member within said housing, said reel means having a varying rotational velocity depending upon the amount of said extensible member wound on said reel;

detector means directly associated with said reel means for detecting the rotation of said reel means and generating an output signal indicative of the degree of rotation of said reel means; and

amendment circuit means responsive to said output signal of said detector means for continuously modifying said output signal of said detector means as a function of said amount of said extensible member wound on said reel means for generating length signals which accurately correspond to the length of said extensible member extending from said housing and said dimension of said object;

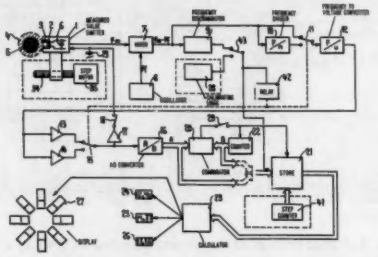
whereby said amendment circuit means compensates for the nonlinear relationship between the distance that said extensible member extends from said housing and said varying velocity of rotation of said reel means.

4,181,961

PROCESS FOR THE MEASUREMENT OF ABSOLUTE VALUES BY MEANS OF A NON-LINEARLY WORKING MEASURED VALUE EMITTER, AND A MEASURING DEVICE FOR CARRYING OUT THE PROCESS

Peter Nopper, Lyss, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Filed Jan. 30, 1978, Ser. No. 873,670
Claims priority, application Switzerland, Feb. 8, 1977, 1480/77
Int. Cl.[2] G06F *15/34;* G01R *33/12*
U.S. Cl. 364—563 **24 Claims**



1. A process for the measurement of absolute values by means of a non-linearly working measured value emitter, comprising the steps of:

carrying out a calibration process wherein for a predetermined number of measured values differing from each other and emitted by said measured value emitter the corresponding absolute values are determined by an accurate auxiliary method and stored each in a store at one of a number of addresses coordinated to the said measured values;

carrying out a measuring process to obtain by means of said measured value emitter corresponding measured values;

interrogating said store by means of address information derived from said measured values; and

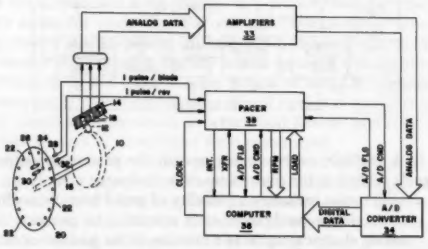
reading from addresses of the store located with said address information the corresponding absolute values stored therein.

4,181,962

DIGITAL PROGRAMMABLE TIMING DEVICE

James C. West, Jr., Colorado Springs, Colo., and Raymond P. Shreeve, Monterey, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1978, Ser. No. 881,960
Int. Cl.[2] G01P *3/00*
U.S. Cl. 364—565 **9 Claims**



1. A system for synchronizing analog data from a rotating

device having a plurality of blades with the rotation of said rotating device which comprises:

(a) means for generating a frequency signal proportional to the speed of rotation of said rotating device and the number of said blades;

(b) means synchronized with said frequency signal for sampling said analog data at a programmable point with respect to said rotating device each revolution; and

(c) means for determining said speed of rotation for each revolution from a reference point derived from said rotating device.

4,181,963

ELECTRONIC CALCULATOR WITH TIME COUNTING FUNCTION

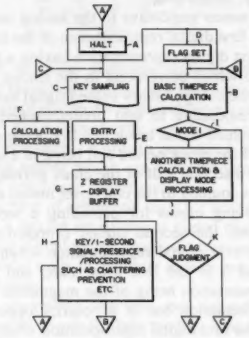
Mikio Yanagawa, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,770

Claims priority, application Japan, Apr. 19, 1977, 52-44658; Apr. 19, 1977, 52-44660; Apr. 19, 1977, 52-44669

Int. Cl.[2] G06F *15/02;* G04B *47/00*

U.S. Cl. 364—705 **32 Claims**



1. An electronic calculator with a time-counting function, comprising:

an oscillator for generating reference frequency signals;

frequency-dividing means coupled to said oscillator for dividing the frequency of the output signal of said oscillator to produce time-counting timing signals;

holding means coupled to said frequency-dividing means for holding an output signal of said frequency-dividing means;

control means coupled to said holding means for controlling calculation or no operation when said holding means holds no time-counting timing signal and for controlling a time-counting operation when said holding means holds a time-counting timing signal;

calculation/time-counting means coupled to said control means for carrying out various calculations including a calculation for obtaining time data, under control of said control means;

memory means coupled to said calculation/time-counting means for storing the time data or other data obtained by said claculation/time-counting means;

a multi-digit display buffer memory coupled to said memory means for temporarily storing the contents of said memory means;

display means coupled to said buffer memory for displaying the data contents of said buffer memory; and

judging means coupled to said buffer memory for judging the digit stored in said buffer memory, by the contents of which the data currently displayed by said buffer memory differs from the data in said memory means to be displayed next by said buffer memory;

said display means displaying said data under control of the output signal of said judging means.

4,181,964

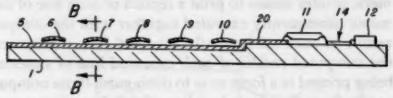
INTEGRATED ELECTRONICS ASSEMBLY ON A PLASTIC CHASSIS

James H. Moore, and Gene D. Lee, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1975, Ser. No. 592,443

Int. Cl.[2] G06F *3/00;* H01H *13/02*

U.S. Cl. 364—708 **11 Claims**



1. An integrated electronic assembly comprising:

a plastic chassis forming at least a portion of a housing for said assembly, an array of cross-bar matrix switches integrated with the plastic chassis, an integrated circuit device and a display device mounted on said chassis, each of the devices and the matrix switches being electrically interconnected.

4,181,965

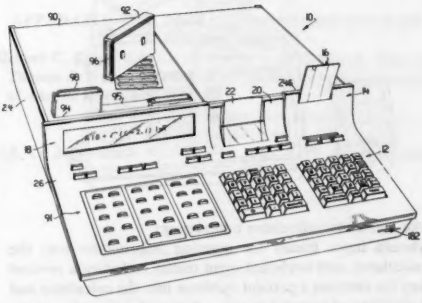
PROGRAMMABLE CALCULATOR INCLUDING PROGRAM TRACE MEANS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,832

Int. Cl.[2] G06F *3/12*

U.S. Cl. 364—710 **8 Claims**



1. An electronic calculator comprising:

keyboard input means including a plurality of alphabetic and numeric keys for entering a line of statements, including algebraic expressions, said keyboard input means including a trace control key for entering a trace statement and an execute control key for initiating execution of an entered line of statements;

memory means for storing a line of statements entered from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for sequentially executing the statements comprising a line of statements entered from said key-

board input means and stored in said memory means to compute the results of selected functions; and

alphameric printer means, coupled to said processing means, for printing alphameric information supplied by said processing means;

said processing means being responsive to actuation of said execute control key, following entry of a line of statements that includes a trace statement, for sequentially executing each of the statements comprising that line of statements and for setting a trace mode of calculator operation upon execution of the trace statement, said processing means including logic means, responsive to execution of the trace statement, for causing the alphameric printer means to print a replica of each line of statements subsequently executed together with the computed results of each subsequently executed line of statements, the computed results of each executed line of statements being printed in a form so as to distinguish those computed results from the printed replica of that line of statements.

4,181,966

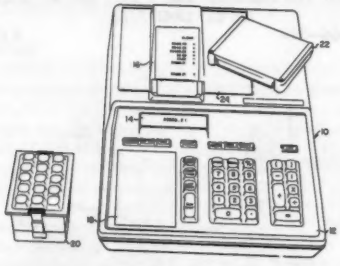
ADAPTABLE PROGRAMMED CALCULATOR INCLUDING A PERCENT KEYBOARD OPERATOR

Freddie W. Wenninger; Donald E. Morris; Jindrich Kohoutek; David S. Maitland; Douglas M. Clifford; Louis T. Schulte, and John C. Keith, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 477,552, Jun. 6, 1974, Pat. No. 3,971,925, which is a continuation of Ser. No. 318,451, Dec. 26, 1972, abandoned. This application Apr. 28, 1976, Ser. No. 681,291

Int. Cl.[2] G06F *7/48*

U.S. Cl. 364—715 **4 Claims**



1. An electronic calculator comprising:

keyboard input means for entering information into the calculator, said keyboard input means including a percent key for entering a percent operator into the calculator and a plurality of keys for entering data and arithmetic operators including an addition operator into the calculator; and

processing means coupled to said keyboard input means, said processing means being responsive to information entered into the calculator from said keyboard input means and to operating states within the calculator for selectively performing calculations and for providing an output indication of the results of those calculations, said processing means being responsive to entry of a first number followed by entry of the addition operator followed by entry of a second number followed by entry of the percent operator for calculating the sum of the first number and a percentage thereof as specified by the second number.

4,181,967

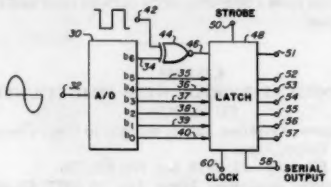
DIGITAL APPARATUS APPROXIMATING MULTIPLICATION OF ANALOG SIGNAL BY SINE WAVE SIGNAL AND METHOD

Harold G. Nash, Tempe, Ariz., and John R. Linford, Broomfield, Colo., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1978, Ser. No. 925,680

Int. Cl.[2] G06F *15/34, 7/52*

U.S. Cl. 364—724 **8 Claims**



1. A quasi digital multiplier for approximating multiplication of an analog waveform by a sine wave signal of a predetermined frequency, comprising:

(a) converter means responsive to the analog waveform for providing a first digital representation of the analog waveform, the first digital representation having a polarity and a magnitude which correspond to the analog waveform;

(b) means for receiving a binary valued signal having a clock period corresponding to said predetermined frequency, the binary valued signal being in a first logic state during a first half of the clock period and being in a second logic state during a second half of the clock period; and

(c) logic means coupled to the converter means and coupled to the receiving means for providing a second digital representation, the second digital representation being equal to the first digital representation when the binary valued signal is in the first logic state, and the second digital representation being of the magnitude of the first digital representation but of a polarity opposite to the polarity of the first digital representation when the binary valued signal is in the second logic state.

4,181,968

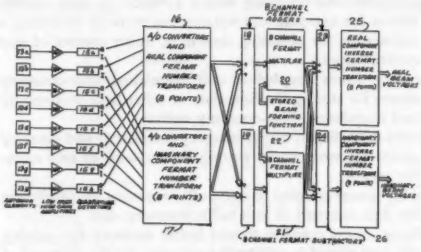
METHOD AND APPARATUS FOR FORMING CONVOLUTIONS OF TWO COMPLEX NUMBER SEQUENCES USING THE FERMAT NUMBER TRANSFORM

Richard N. Johnson, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1978, Ser. No. 915,418

Int. Cl.[2] G06F *15/34*

U.S. Cl. 364—728 **15 Claims**



1. In combination with a computing system wherein all arithmetic is performed modulo a number of the form 2^b+1, wherein $b=2^n$ and n is an integer, apparatus for representing

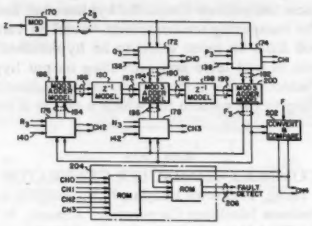
complex numbers of the form A+jB comprising means for replacing said complex numbers by numbers of the form $A \pm 2^{b/2}B$.

4,181,969

SYSTEM FOR DETECTING AND ISOLATING STATIC BIT FAULTS IN A NETWORK OF ARITHMETIC UNITS

Winthrop W. Smith, Jr., Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1978, Ser. No. 870,531
Int. Cl.² G06F *11/00*
U.S. Cl. 364—739 **20 Claims**



1. A digital processor including apparatus for detecting a static bit fault condition therein, said processor comprising:

a first portion of arithmetic units including a set of non-linear operators for arithmetically operating on a first set of binary coded digital words to generate a plurality of output digital words which are correspondingly associated with said non-linear operations;

a second portion of arithmetic units for arithmetically operating on a second set of binary coded digital words and said output digital words generated from said first portion of arithmetic units to generate at least one output binary coded words;

means for converting said first and second set of binary coded digital words to their modulo 3 equivalents;

a first modeling means for detecting a static bit fault which may occur in said first portion of arithmetic units and said first modeling means by processing said modulo 3 equivalents of said first set of binary digital words in accordance with a modulo 3 emulation of the arithmetic operations of said first portion of arithmetic units to generate a set of modulo 3 coded results and by comparing said set of modulo 3 coded results and the modulo 3 equivalents of a correspondingly associated set of preselected binary digital words intermediate to the non-linear operations performed by said first portion of arithmetic units for non-equivalence, a non-equivalence condition being an indication of the existence of a static bit fault, said first modeling means being further operative to generate a third set of digital words which are the modulo 3 representatives of a predetermined portion of each of said preselected binary coded words, said predetermined portions being based on the non-linear operations from which the digital words were preselected; and

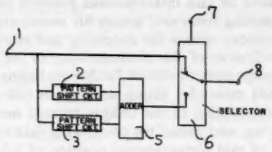
a second modeling means for detecting a static bit fault which may occur in said second portion of arithmetic units and said second modeling means by processing said modulo 3 equivalents of said second set of binary digital words and said third set of digital words in accordance with a modulo 3 emulation of the arithmetic operations of said second portion of arithmetic units to generate at least one modulo 3 coded result and by comparing said at least one result and the modulo 3 equivalent of said at least one output binary word generated from said second portion of arithmetic units for non-equivalence, a non-equivalence condition being an indication of a static bit fault.

4,181,970

DIGITAL ATTENUATOR FOR COMPRESSED PCM SIGNALS

Kazuto Izumi, and Kazuo Izumi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 701,574, Jul. 1, 1976, Pat. No. 4,115,785, which is a continuation of Ser. No. 507,812, Sep. 20, 1974, Pat. No. 4,004,140. This application May 26, 1978, Ser. No. 910,065
Claims priority, application Japan, Oct. 8, 1973, 48-113109
Int. Cl.² G06F *7/39*
U.S. Cl. 364—760 **2 Claims**



1. A digital attenuator comprising:

first and second pattern shift circuits;

means for branching an input compressed PCM signal to each of said pattern shift circuits;

said first pattern shift circuit having means for shifting the branched input PCM signal to the lower side by a predetermined number of bits from one bit to five bits;

said second pattern shift circuit having means for shifting the branched input PCM signal to the lower side by a predetermined number of bits, from one bit to five bits, which differ from those in the first pattern shift circuit;

a first adder for adding the outputs from said pattern shift circuits to provide an attenuated PCM signal; and

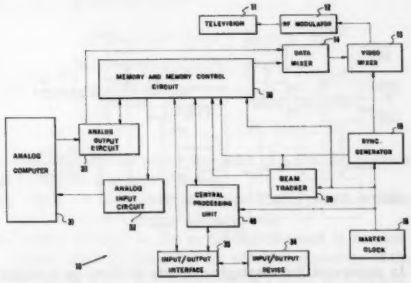
a selector for selecting the input PCM signal when no attenuation control signal is applied to the selector, or selecting the attenuated PCM signal when an attenuation control signal is applied to the selector, as the output signal.

4,181,971

APPARATUS FOR PRESENTING A SEQUENCE OF FIXED PICTURES

Richard C. Frey; Malcolm R. Railey, both of Akron, Ohio, and Thomas J. Wargo, Waukegan, Ill., assignors to The University of Akron, Akron, Ohio

Filed Feb. 9, 1976, Ser. No. 656,395
Int. Cl.² G06F *3/14*
U.S. Cl. 364—900 **35 Claims**



1. Apparatus for dynamically presenting a sequence of fixed pictures each having one or more images, comprising:

image characteristics input means for providing signals indicative of the characteristics of the images;

image position input means for providing signals indicative of the desired position of each image in each of the sequence of fixed pictures;

means for displaying the sequence of fixed pictures;

means for scanning said means for displaying to present each image within each fixed picture;

means for monitoring said means for scanning and providing a signal indicative of the instantaneous position of said means for scanning;

control means including

register circuit means for receiving, storing and transmitting said signals from said image position input means,

image control circuit means for receiving said signals indicative of the desired position of each image from said register circuit means and for receiving said signals indicative of said instantaneous position of said means for scanning from said means for monitoring,

image memory means for receiving and storing said signals indicative of the characteristics of the images,

said image control circuit further including first gating circuit means for gating said signals indicative of the characteristics of the images to said means for displaying, and means for comparing said signal indicative of said instantaneous position of said means for scanning with said signal indicative of the desired position of each image and upon a match thereof enabling said first gating circuit means to permit the appropriate image to be displayed, said means for comparing including reset means for resetting said means for comparing after the presentation of each image and after the completion of each scan by said means for scanning and to provide an output signal indicative of the completion of each scan by said means for scanning; and

means for directing said control means to receive and store said signals from said image characteristics input means, to receive and store said signals from said image position input means for a first fixed picture, to present each image for said first fixed picture, and, upon the occurrence of said output signal indicative of the completion of each scan, directing said control means to receive and store said signals from said image position input means for the next fixed picture, so that repetitive operation thereof will dynamically present a sequence of fixed pictures.

4,181,972

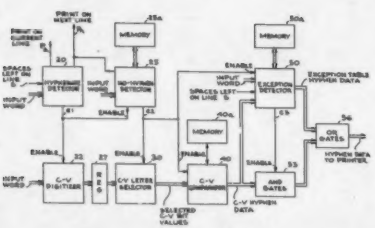
MEANS AND METHODS FOR AUTOMATIC HYPHENATING WORDS

John L. Casey, Santa Barbara, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 682,769, May 3, 1976, abandoned. This application Jul. 6, 1976, Ser. No. 702,676

Int. Cl.[2] G06F *7/20*

U.S. Cl. 364—900 **9 Claims**



1. In apparatus for displaying words in lines on a display device, hyphenating control means for automatically controlling the hyphenating of words which will only partially fit at the end of a line, said hyphenating control means comprising:

means responsive to the length of an input word and to the number of spaces remaining on a line for detecting the presence of a hyphenate situation with respect to said input word;

means responsive to the detection of a hyphenate situation with respect to an input word for digitizing a predetermined portion thereof such that each consonant is represented by one binary value and each vowel is represented by the other binary value, said predetermined portion comprising a consecutive group containing the last characters of the input word which will fit on the line;

a memory storing a table of consonant-vowel bit value patterns representing the possible patterns obtainable as a result of digitizing said group, said memory additionally storing an individually selectable hyphenation indication for each pattern of said table indicating how a word which produces the pattern should be hyphenated; and

means for comparing the consonant-vowel bit value pattern derived from an input word to be hyphenated with the patterns in said table and providing output hyphenation data based on the stored hyphenation indication corresponding to the pattern for which a match is obtained.

4,181,973

COMPLEX CHARACTER GENERATOR

Samuel C. Tseng, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,976

Int. Cl.[2] G06F *3/14, 3/12;* **G06K** *15/18*

U.S. Cl. 364—900 **11 Claims**

1. In character generating apparatus, a method of generating characters in a complex character set on a utilization device with each character in said complex character set being described by elements in an original m by n element matrix, where m and n are integers which may or may not be equal, said method comprising the steps of:

defining, in terms of elements, a plurality of different patterns which occur frequently in said complex character set;

assigning a different symbol to represent each one of said different patterns; defining a sparse m by n character matrix for each character in said complex character set in terms of the symbols representing the combination of said different patterns forming the corresponding original character matrix, with each pattern position in a given character being represented by the assigned symbol for that pattern, with each symbol being positioned in the sparse matrix where a predetermined one of the elements in the corresponding pattern in the original character matrix is positioned;

storing in binary form in a storage device each sparse matrix representation in said complex character set as a compacted character, with the information stored for each compacted character being: (a) the symbols in the sparse matrix, (b) the positions of the symbols in the sparse matrix, and (c) the size parameters of the pattern represented

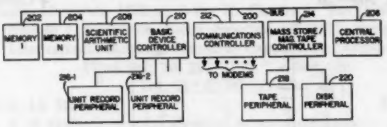
by the symbol, if the symbol represents a family of patterns which differ only in size; and

generating on said utilization device a given complex character in response to retrieving and decoding the binary information stored which defines the corresponding compacted complex character.

4,181,974
SYSTEM PROVIDING MULTIPLE OUTSTANDING INFORMATION REQUESTS

Richard A. Lemay, Bolton, and John L. Curley, Sudbury, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 5, 1978, Ser. No. 867,266
Int. Cl.[2] G06F *3/00, 1/04*
U.S. Cl. 364—900 **17 Claims**



1. A system comprising a plurality of units coupled to transfer information over a common bus between said plurality of units during asynchronously generated information transfer cycles, said system further comprising:

A. means, included in a first unit of said plurality of units, for enabling the transfer of first information from said first unit to a second unit of said plurality of units during a first transfer cycle, said first information indicating a request for a transfer of second information from said second unit to said first unit;

B. means, included in said first unit, for enabling the transfer of third information from said first unit to an other unit of said plurality of units during a second transfer cycle, said third information indicating a request for a transfer of fourth information from said other unit to said first unit; and

C. means, included in each of said plurality of units, for enabling the transfer of information between an additional two units of said plurality of units during any transfer cycle generated between the time of an earliest transfer cycle and time of a latest transfer cycle, said earliest transfer cycle being either of said first transfer cycle or said second transfer cycle whichever is earlier, and wherein said latest transfer cycle is the latest transfer cycle associated with the transfer of said third information and said fourth information.

4,181,975
DIGITAL DELAY LINE APPARATUS

James R. Jenkins, Fort Worth, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 10, 1978, Ser. No. 923,262
Int. Cl.[2] H03K *5/00*; **G06F** *3/00*
U.S. Cl. 364—900 **5 Claims**

1. Apparatus for providing continuous delay adjustment of a digital delay line comprising, in combination:

first means for supplying data bit stream signals;

second means for supplying clock bit stream signals;

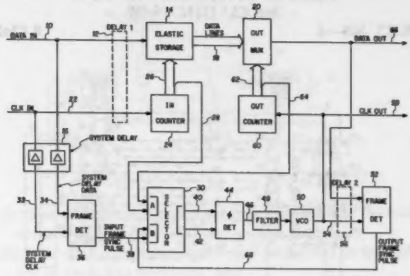
elastic store means, connected to said first and said second means for receiving signals therefrom, said elastic store means operating to consecutively store received data bits at times dictated by clock bit signals and to parallel output stored data bits;

multiplex means, including address input means, data input means and data output means, for outputting at least one addressed input bit upon command;

means connecting said elastic store means to said data input means of said multiplex means for supplying data bits thereto;

phase lock loop means, including first and second signal input means and command signal output means, for altering command signals in accordance with deviation of phasing of signals applied at said first and second signal input means from a desired value;

means connecting said data output means of said multiplex



means to said first signal input means of said phase lock loop means;

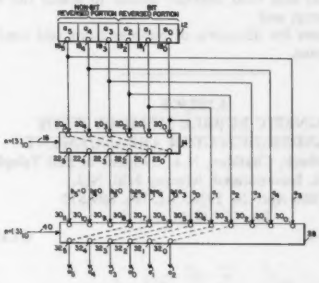
means for supplying signals of variable phase, with respect to the phase of data signals supplied by said first means, to said second signal input means of said phase lock loop means; and

means connecting said command signal output means of said phase lock loop means to said address input means of said multiplex means for supplying signals thereto.

4,181,976
BIT REVERSING APPARATUS

Michael J. Collins, Merrimack, and Michael T. S. Ching, Nashua, both of N.H., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 10, 1978, Ser. No. 950,204
Int. Cl.[2] H03K *21/10*
U.S. Cl. 364—900 **3 Claims**



1. Apparatus for reversing the order of a selected portion of an m bit digital word, comprising:

(a) means for producing the m bit digital word in bit-reversed order at a first set of terminals;

(b) means coupled to the m bit digital word in non-bit reversed order for coupling the unselected portion of the m bit digital word in non-bit reversed order to a second set of terminals; and

(c) shifter means for coupling the portion of the first set of terminals and the second set of terminals to a set of m output terminals producing an output digital word, such output digital word being the m bit digital word with the

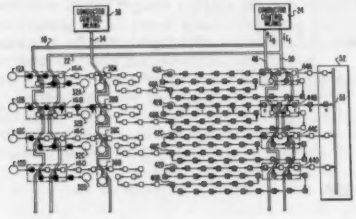
selected portion thereof in bit-reversed order and the unselected portion in non-bit reversed order.

4,181,977

RANDOM ACCESS BUBBLE MEMORY WITH UNIFIED READ/WRITE CYCLE

David C. Van Voorhis, Tampa, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,976
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—4 **8 Claims**



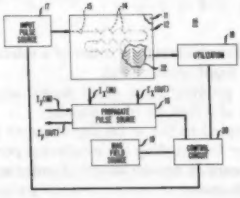
1. A memory system for magnetic bubble domains in a magnetic sheet comprising:
- generator means for producing a plurality of continuous streams of bubbles;
- storage loop means for the storage of bubbles including a plurality of storage loops;
- write decoder means adapted to select one of said storage loops toward which a first continuous stream of bubbles is to be directed;
- annihilator means associated with said write decoder means and adapted to destroy all continuous streams of bubbles other than said first continuous stream,
- annihilator switch means associated with said write decoder means and adapted to transform said first continuous stream of bubbles from said write decoder means into a data pattern;
- read decoder means associated with said storage loop means and adapted to select the storage loop from which the bubbles are to be removed;
- conductor control means for activating said write decoder means and said read decoder means to select the same storage loop; and
- sensing means for detection of bubbles from said read decoder means.

4,181,978

MAGNETIC BUBBLE MEMORY WITH EXPANDER-DETECTOR ARRANGEMENT

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1978, Ser. No. 899,577
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **6 Claims**



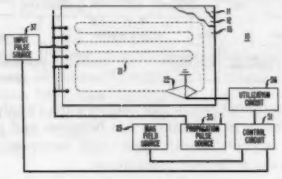
1. A magnetic bubble memory comprising a first layer of material in which magnetic bubbles can be moved, current responsive means for moving magnetic bubbles from an input position to a detector stage, and a multistage expander-detector arrangement operative to elongate a bubble in said layer, said current responsive means comprising a second layer of electrically conducting material coupled to said first layer and including a plurality of apertures therein for defining a multistage path of bubble propagation along an axis, said expander-detector arrangement comprising in successive stages increasingly greater numbers of apertures aligned laterally with respect to said axis.

4,181,979

MAGNETIC BUBBLE MEMORY WITH SINGLE-LEVEL BUBBLE FUNCTIONAL ELEMENTS

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 12, 1978, Ser. No. 914,960
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—20 **4 Claims**



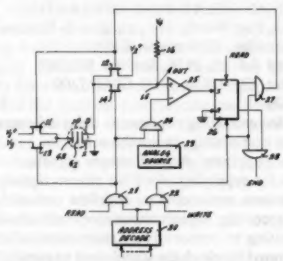
1. A magnetic bubble memory including a first layer of material in which magnetic bubbles can be moved, means for moving bubbles in said layer along a propagation path, said means comprising a second layer of electrically-conducting material including therein a pattern of apertures for defining said path, said pattern including slots for defining in said second layer at least first and second portions in which currents can be impressed alternatively in said first portion alone or in said first and second portions in parallel, said slots being adapted for defining a contoured current path in response to a current impressed in said first portion alone and means for impressing currents in said first or in said first and second portions selectively.

4,181,980

ACQUISITION AND STORAGE OF ANALOG SIGNALS

Michael R. McCoy, Santa Clara, Calif., assignor to Electronic Arrays, Inc., Mountain View, Calif.

Filed May 15, 1978, Ser. No. 905,991
Int. Cl.[2] G11C *27/00, 11/40*
U.S. Cl. 365—45 **6 Claims**



6. A device for storing analog signals of variable magnitude as supplied by a source for analog signals, comprising:
- a semiconductor device having source and drain electrodes, a channel region covered by insulation, a first gate elec-

trode completely embedded in the insulation above the channel region to establish a floating gate and a second gate electrode above the first gate electrode but isolated therefrom;

first circuit means connected to the source-to-drain path of the semiconductor device, to the second gate and to the source, to apply to the first gate a charge representing the analog signal from the source; and

second circuit means connected to the source-to-drain path of the semiconductor device and to the second gate to monitor the current flow through the source-to-drain path of the semiconductor device and providing a signal whose analog value represents the analog signal from the source and a representation of which is stored as a charge on the first gate.

4,181,981

BIPOLAR TWO DEVICE DYNAMIC MEMORY CELL

Badih El-Kareh, Milton; John E. Gersbach, Burlington, and Russell J. Houghton, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,126

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—181 **8 Claims**

1. A dynamic bipolar memory array comprising:

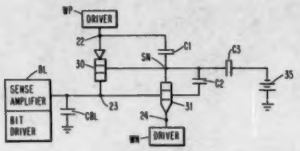
a read line,

a bit line,

a pair of complementary transistors each having a base, a collector and an emitter,

one of said pair of transistors being a read transistor having its emitter coupled to said read line,

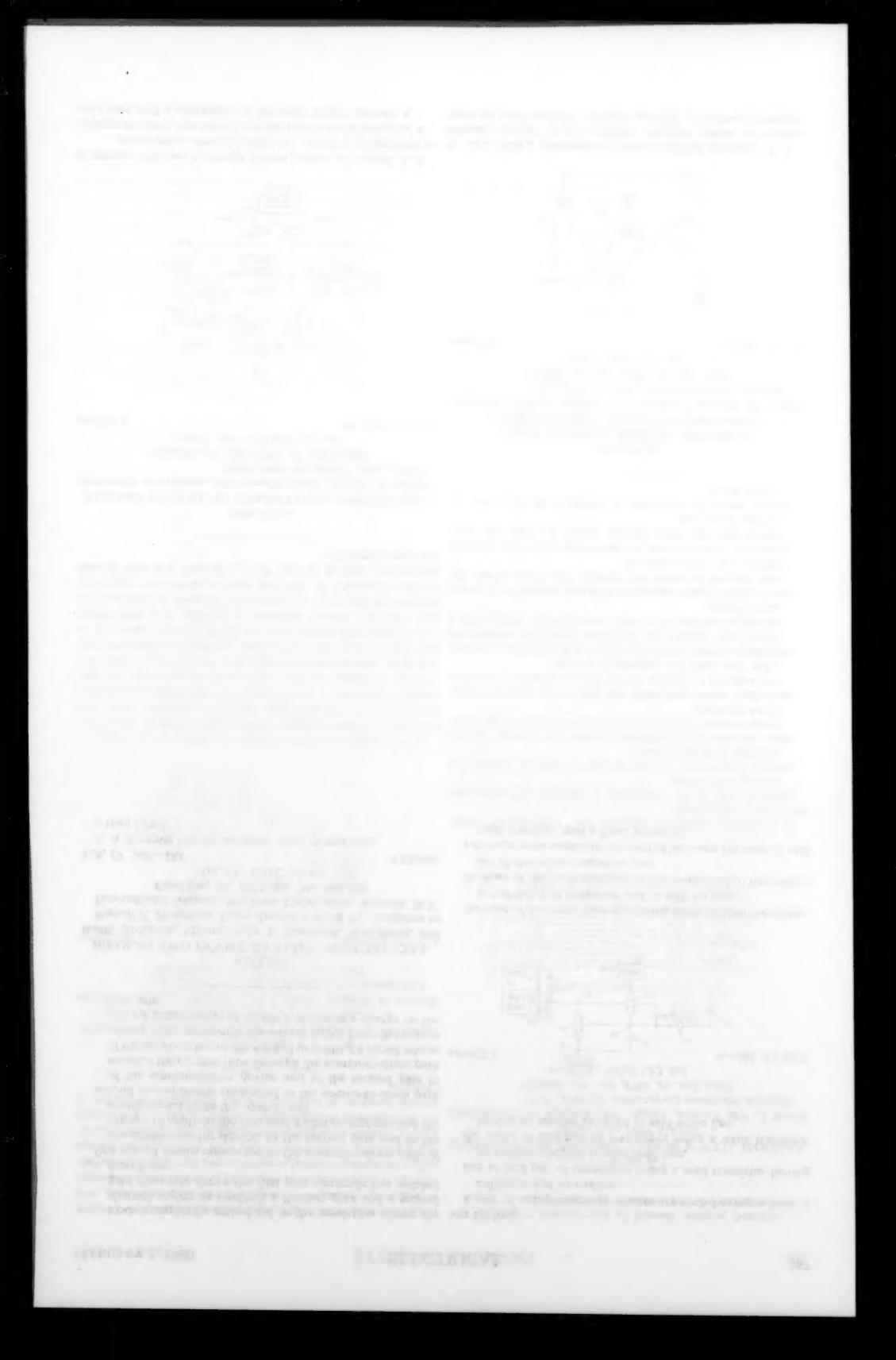
the other of said pair of transistors being a write transistor having its emitter coupled to said write line,



the base of the write transistor being connected to the collector of the read transistor and to said bit line,

the base of the read transistor being connected to the collector of the write transistor, and

a storage node capacitor connected between the base of said read transistor and a fixed potential.



DESIGN PATENTS

GRANTED JAN. 1, 1980

ERRATA

For CLASS	See PATENT NO.
D23–025	253,799
D03–038	253,855

DESIGN PATENTS

GRANTED JAN. 1, 1980

ERRATA

253,796

OUTSOLE FOR SPORTS SHOE

Joel K. Wechsler, Weston, Mass., assignor to Eltra Corporation, Toledo, Ohio

Filed Aug. 24, 1977, Ser. No. 827,271

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—321

253,797

OUTSOLE FOR SPORTS SHOE

Joel K. Wechsler, Weston, Mass., assignor to Eltra Corporation, Toledo, Ohio

Filed Aug. 24, 1977, Ser. No. 827,404

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—321

253,798

AXE SCABBARD

Albert Altmiller, Rte. 1, Box 73, Orofino, Id. 83544

Filed Aug. 9, 1977, Ser. No. 823,157

Term of patent 14 years

Int. Cl. D02—*99*

U.S. Cl. D2—400

253,799

FAUCET OR SIMILAR ARTICLE

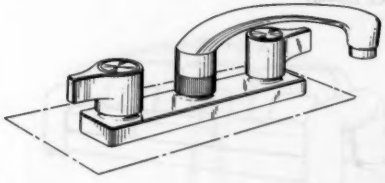
Dominic A. Saporito, Fanwood, and Donald M. Genaro, Haworth, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,157

Term of patent 14 years

Int. Cl. D23—*01*

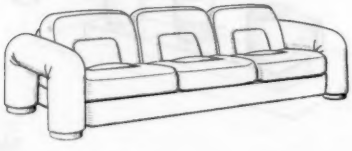
U.S. Cl. D23—25



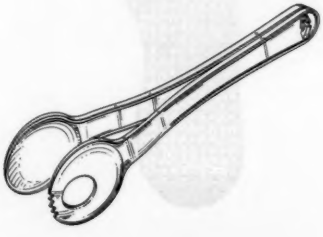
253,800
DISPLAY STAND
Ronald P. Eckert, Northbrook, Ill., assignor to DLM, Inc., Niles, Ill.
Filed Aug. 7, 1978, Ser. No. 931,835
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

253,802
WINE RACK
Barry H. Loud, and Eileen M. Redmon, both of 1955 Sherrington, #J302, Newport Beach, Calif. 92663
Filed Jul. 5, 1977, Ser. No. 812,825
Term of patent 14 years
Int. Cl. D6—*04*; D7—*06*
U.S. Cl. D7—71

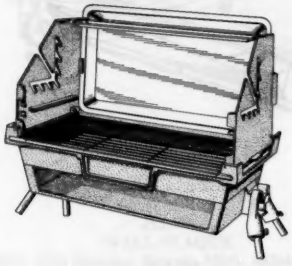
253,801
SOFA OR SIMILAR ARTICLE
Lester Beall, High Point, N.C., assignor to Modern Angel Furniture Manufacturing, Inc.
Filed Dec. 6, 1977, Ser. No. 858,004
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



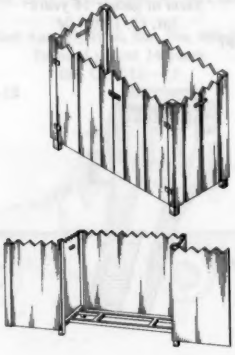
253,803
SERVING TONGS OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 16, 1978, Ser. No. 887,262
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—105



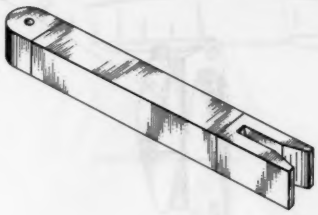
253,804
BARBEQUE GRILL
Stephan H. A. Wandel, Bremen, Fed. Rep. of Germany, assignor to EWG Import-und Export-Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany
Filed Jan. 16, 1978, Ser. No. 869,496
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—107



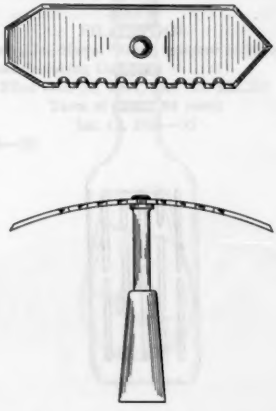
253,805
GARBAGE CAN ENCLOSURE
George C. Klick, 1910 Hebron Dr., Hendersonville, N.C. 28739
Filed Aug. 26, 1977, Ser. No. 828,049
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—189



253,806
GARDEN WEEDER IMPLEMENT
Mayo A. Cox, 1156 E. Tennessee St., Tallahassee, Fla. 32308
Filed Oct. 27, 1977, Ser. No. 846,263
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—1



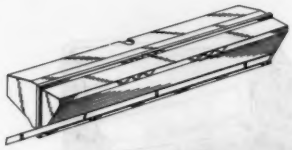
253,807
BLADE FOR A GARDEN HOE
Frank E. Baylis, 221 Richmond Ave., West Haven, Conn. 06516
Filed Oct. 25, 1977, Ser. No. 845,169
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11



253,808
CORNER BRACKET ASSEMBLY FOR LIFT GATE OF A WOOD SLATTED HAY RACK OR THE LIKE
H. Frederick Lange, P.O. Box 7624, Hollins, Va. 24019, and LeRoy R. Boggs, P.O. Box 3586, Bristol, Tenn. 37620
Filed Oct. 12, 1977, Ser. No. 841,648
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371

253,809
BOTTLE
Philip F. Hartung, Dean Bldg., 655 Main St., East Greenwich, R.I. 02818
Filed Sep. 27, 1977, Ser. No. 836,983
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—61

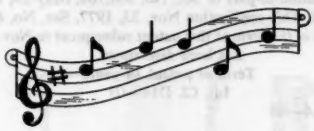
253,810
DEVELOPER POWDER CONTAINER
Stanford C. Stone, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Sep. 29, 1977, Ser. No. 837,950
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—224



253,811
PRESSURE GAUGE
Zigmund G. Bljumshtein, ulitsa Pavljukhina, 85, kv. 25, and Lev A. Bychkin, ulitsa Universitetskaya, 5/37, kv. 14, both of Kazan, U.S.S.R.
Filed Jul. 1, 1977, Ser. No. 812,466
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

253,812
INVENTORY CONTROL COUNTER
Harry N. Novak, 7410 N. Talman, Chicago, Ill. 60645
Filed May 2, 1977, Ser. No. 793,177
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—97

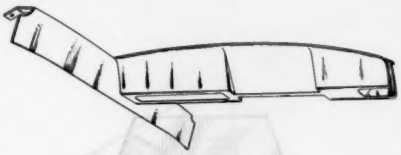
253,813
MEDALLION
Frank A. Salvaggio, 4612 Elmwood, Metairie, La. 70003
Filed Feb. 28, 1978, Ser. No. 882,232
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—99



253,814
WALL PLAQUE
Joe B. Hill, 4930 Spokane, Detroit, Mich. 48204
Filed Nov. 25, 1977, Ser. No. 854,991
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—132

253,815
COMMANDO ARMORED PATROL CAR
James M. Bemiss, 24617 Star Valley Dr., St. Clair Shores, Mich. 48080
Filed Apr. 27, 1978, Ser. No. 900,464
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

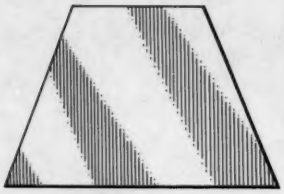
253,816
VEHICLE OVERHEAD DISPLAY PANEL
Timothy R. Turek, 605 S. Prospect, #206, Redondo Beach, Calif. 90277
Filed Feb. 21, 1978, Ser. No. 879,796
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



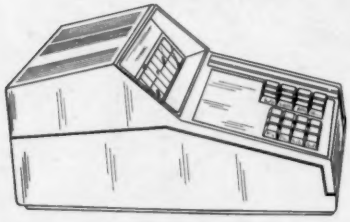
253,817
VEHICLE WHEEL
Kurt W. Lohmeyer, Fullerton, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.
Filed Oct. 11, 1977, Ser. No. 840,554
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

253,818
FILM SPOOL
Alan C. Kilberg, Jr., Hugo, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Dec. 28, 1977, Ser. No. 865,306
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D14—10

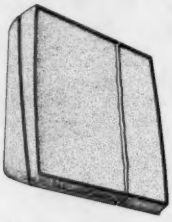
253,819
LOW FREQUENCY LOUDSPEAKER
Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.
Filed Nov. 14, 1977, Ser. No. 851,536
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35



253,820
KEYBOARD TERMINAL
John B. Coppola, Trumbull, Conn., and James R. Ferrara, Pound Ridge, N.Y., assignors to Bunker Ramo Corporation, Oak Brook, Ill.
Filed May 5, 1977, Ser No. 794,205
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43

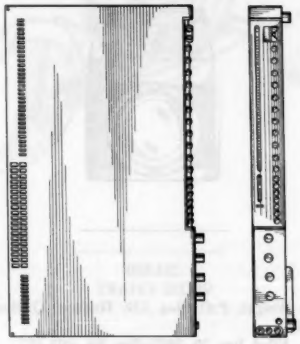


253,821
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No. Des. 237,506, which is a continuation-in-part of Ser. No. 424,413, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 364,704, May 29, 1973, abandoned. This application Nov. 23, 1977, Ser. No. 854,504
The portion of the term of this patent subsequent to Nov. 4, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

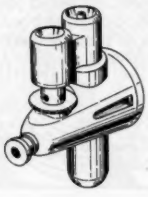


253,822
PORTABLE RADIO
Masanori Hamada, Yao, and Benito Mishiro, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,287
Claims priority, application Japan, Jan. 20, 1977, 52-1473
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

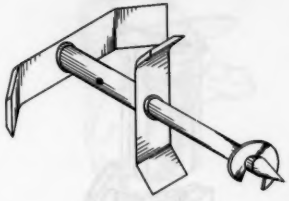
253,823
COMBINED TUNER AND AMPLIFIER
Dieter Rams, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 21, 1977, Ser. No. 844,423
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 73 MR 8605
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



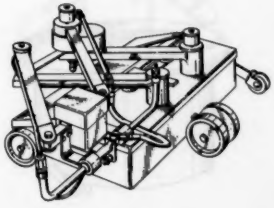
253,824
GAS ENGINE
Glenn K. Hargrave, Shannon, Ireland, assignor to Technopower Enterprises Limited, Shannon, Ireland
Filed Sep. 20, 1977, Ser. No. 834,944
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—3



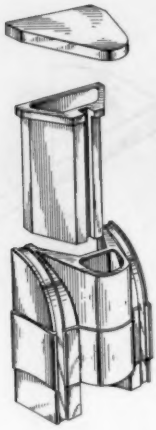
253,825
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,123
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



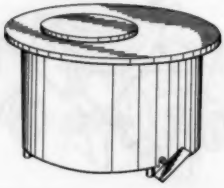
253,826
FLUID JET MACHINE FOR WASHING OR COATING A VEHICLE
Norimasa Sano, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan
Filed Nov. 21, 1977, Ser. No. 853,197
Claims priority, application Japan, Jun. 2, 1977, 52-21290
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—37



253,827
WAX STRIPPER AND APPLICATOR
Richard J. Torres, 1025 Grevelia St., South Pasadena, Calif. 91030
Filed Aug. 19, 1977, Ser. No. 826,154
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48

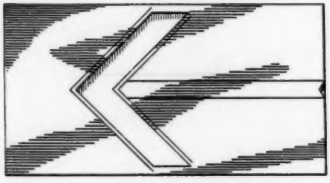


253,828
POTTERS WHEEL
Paul E. Soldner, P.O. Box 90, Aspen, Colo. 81611
Filed May 15, 1978, Ser. No. 905,797
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—130

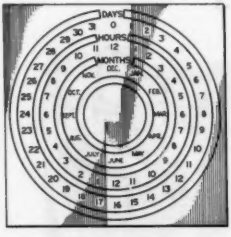


253,829
MIRROR REFLEX CAMERA
Bodo Mielke, Wolfenbüttel; Dieter Mankau, and Friedrich Papke, both of Brunswick, all of Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 721,331, Sep. 8, 1976, Pat. No. Des. 249,949. This application Nov. 2, 1976, Ser. No. 738,339
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 1086; Aug. 30, 1976, 1101
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1

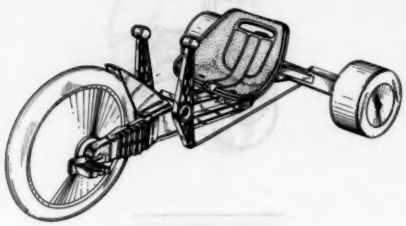
253,830
SLIDE CHART
R. Wallace Wright, P.O. Box 329, Hudson, Quebec, Canada (JOP 1HO)
Filed Jun. 20, 1977, Ser. No. 801,352
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D18—9



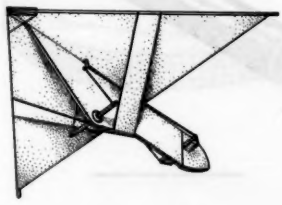
253,831
MEDICAL CALENDAR
Vivian L. Carmichael, Rte. 4, Box 621, Aiken, S.C. 29801
Filed Apr. 8, 1977, Ser. No. 786,045
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25



253,832
TOY VEHICLE
Calvin S. Cook; James Smith, both of Erie, Pa.; John A. Vernon, Jr., Bethel, and Richard Ratkiewich, Prospect, both of Conn., assignors to Louis Marx & Co., Inc., Stamford, Conn.
Division of Ser. No. 711,044, Aug. 2, 1976. This application Aug. 31, 1977, Ser. No. 829,544
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—80



253,833
KITE
Lavon C. Miller, 5952 Tibet Dr., Dayton, Ohio 45424
Filed Dec. 19, 1977, Ser. No. 862,148
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88



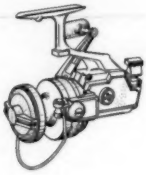
253,834
TOY PROJECTILE
William C. Hall, 4600 DeVoe Rd., Winston-Salem, N.C. 27107
Filed Jan. 19, 1978, Ser. No. 870,935
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89

253,835
DOLL
Robert E. Hope, Stone Mountain, Ga., assignor to Atlanta National League Baseball Club, Inc., Atlanta, Ga.
Filed Nov. 14, 1977, Ser. No. 851,548
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—158

253,836
MEDICAL RAG DOLL
Zula B. Cox, Rte. 1 Box 5A, Folsom, La. 70437
Continuation-in-part of Ser. No. 628,281, Nov. 3, 1975, abandoned. This application Aug. 24, 1977, Ser. No. 827,419
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

253,837
FISHING REEL
Etsuo Hiraishi, Hiroshima, and Teruo Okamoto, Mihara, both of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Oct. 4, 1977, Ser. No. 840,062
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

253,838
FISHING REEL
Masakazu Sakamoto, and Takeshi Shohoji, both of Fukuyama, Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Oct. 4, 1977, Ser. No. 840,182
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



253,839
FISHING REEL
Yasomatsu Morishita, Kure, Japan, assignor to Ryobi Ltd., Fuchu, Japan
Filed Feb. 21, 1978, Ser. No. 879,403
Claims priority, application Japan, Aug. 20, 1977, 52-33063
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

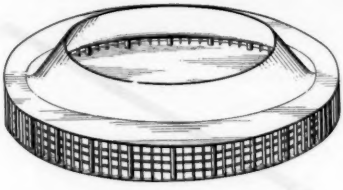
253,840
FISHING REEL
Etsuo Hiraishi, Hiroshima, Japan, assignor to Ryobi Ltd., Fuchu, Japan
Filed Feb. 28, 1978, Ser. No. 881,941
Claims priority, application Japan, Nov. 2, 1977, 52-43631
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

253,841
MAGNETIC WATER CONDITIONER
Charles H. Sanderson, 3717 Fritcha Ave., Fort Wayne, Ind. 46806
Filed May 20, 1977, Ser. No. 798,903
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

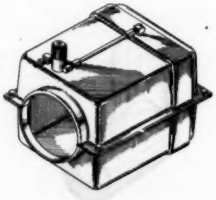
253,842
IRRIGATION SPRAY NOZZLE
Carl E. Addison, and Rocky J. Comes, both of c/o Addison Manufacturing Co., R.R. 1, Cimarron, Kans. 67835
Filed Feb. 27, 1978, Ser. No. 881,880
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

253,843
IRRIGATION CONTROL CONSOLE
Mario F. Fernandez, Minneapolis, Minn., assignor to The Toro Co., Minneapolis, Minn.
Filed Jun. 13, 1977, Ser. No. 805,861
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38

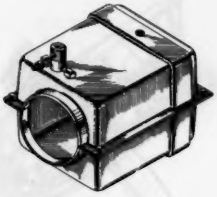
253,844
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,034
Term of patent 14 years
Int. Cl.[2] D23—*04*
U.S. Cl. D23—139



253,845
BY-PASS HUMIDIFIER
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Feb. 22, 1978, Ser. No. 880,850
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



253,846
BY-PASS HUMIDIFIER
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Feb. 22, 1978, Ser. No. 880,853
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



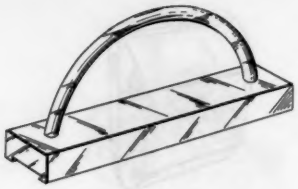
253,847
HOUSE
William Major, P.O. Box 4091, Incline Village, Nev. 89450, and Betty Facciolla, 3788 Jay La., Reno, Nev. 89512
Filed Dec. 6, 1977, Ser. No. 857,934
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23

253,848
CERAMIC WATER PIPE
Morry Karp, Los Angeles, Calif., assignor to Glass Head, Inc., Los Angeles, Calif.
Filed Apr. 13, 1978, Ser. No. 896,049
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

253,849
HEATED COMB
George A. Schroeder, Chicago, Ill., assignor to Johnson Products Co., Inc., Chicago, Ill.
Filed Oct. 25, 1977, Ser. No. 845,151
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—24

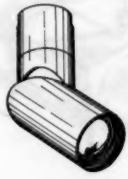
253,850
COMBINED SPRAY ATOMIZER AND COMB
William E. Haselrig, Ontario, Calif., assignor to Transwestern Sales, Inc., Los Angeles, Calif.
Filed Dec. 27, 1977, Ser. No. 864,643
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

253,851
NAIL FILE HOLDER OR SIMILAR ARTICLE
Paul A. Sperry, 90 Gilnock Dr., New Haven, Conn. 06515
Filed Jul. 25, 1977, Ser. No. 818,541
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—59



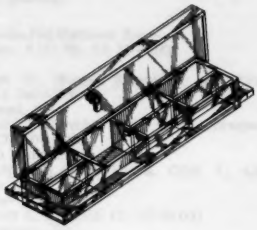
253,852
CAT COLLAR
Horst F. Zajitz, Osborne Park, Australia, assignor to Blue Cross Products Pty. Ltd., Osborne Park, Australia
Filed Jun. 13, 1977, Ser. No. 805,849
Claims priority, application Australia, Dec. 17, 1976, 70890
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38

253,853
LIGHTING FIXTURE
Michael Gerber, Beverly Hills, Calif., assignor to Trakliting, Inc., Industry, Calif.
Filed Aug. 1, 1977, Ser. No. 820,805
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



253,854
TRACK LIGHT
Joseph R. Strignano, 300 E. 56th St., New York, N.Y. 10022
Filed Jan. 30, 1978, Ser. No. 873,286
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

253,855
TACKLE BOX
Lawrence L. Hopf, 4459 Greenland, Mesquite, Tex. 75150
Filed Jul. 28, 1977, Ser. No. 819,630
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D3—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF JANUARY, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
Kickle, Hunter L.; Ball, William J., Jr.; and Von Schanefelt, Robert, 4,181,747, Cl. 426-615.000.

AB Atomenergi: *See—*
Westerberg, Stefan, 4,181,854, Cl. 250-336.000.

AB Olle Lindstrom: *See—*
Lindstrom, Olle B., 4,181,776, Cl. 429-27.000.

AB Volvo: *See—*
Lindberg, Torsten G., 4,181,198, Cl. 188-1.00C.

Aber, Dick S. Apparatus for holding pierced earrings for display and/or storage. 4,181,224, Cl. 206-486.000.

Abstein, Henry T., Jr.; and Page, Dennis B., to Hughes Aircraft Company. Means for adjusting the area of an orifice in a vibration system. 4,181,025, Cl. 73-665.000.

Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., to Hughes Aircraft Company. Quasi-random pneumatic vibration facility and automatic frequency modulating system therefor. 4,181,026, Cl. 73-665.000.

Abu-Shumays, Ahmad; and Johnson, Edward L., to Varian Associates, Inc. Liquid chromatography system with packed flow cell for improved fluorescence detection. 4,181,853, Cl. 250-304.000.

Achelpohl, Fritz, to Windmoller & Holscher. Lifting tackle for filled sacks. 4,181,345, Cl. 294-103.00R.

Acuff, David W., to Darling Store Fixtures, a division of the Marmon Group, Inc. Store display fixture. 4,181,230, Cl. 211-208.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Power brake control valve for vehicles. 4,181,371, Cl. 303-50.000.

Adachi, Yumiko: *See—*
Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, 4,181,714, Cl. 424-117.000.

Add-a-Bed Corporation: *See—*
Spanke, Theodore J., 4,181,351, Cl. 296-100.000.

Adler, Karl-Heinz: *See—*
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, 4,181,112, Cl. 123-148.00E.

Adler, Reinhard; and Maatje, Henri, to International Standard Electric Corporation. High-reliability vehicle control system. 4,181,945, Cl. 364-436.000.

Adomeit, Heinz-Dieter. Automatic rapid lock belt roll-up clamp for safety belts. 4,181,273, Cl. 242-107.200.

Affolter, Bill G. Manhole cover lifting device. 4,181,290, Cl. 254-124.000.

AGFA-Gevaert, A.G.: *See—*
Klinkhammer, Ralf L.; and Klotz, Artur, 4,180,905, Cl. 29-786.000.
Kluczynski, Achim; and Altmann, Erik, 4,181,271, Cl. 242-74.000.
Laar, Erwin; Ganser, Friedrich; and Hammer, Thomas, 4,181,270, Cl. 242-66.000.

AGFA-GEVAERT N.V.: *See—*
Sels, Francis J.; Kokelenberg, Hendrik E.; and Van Veelen, George F., 4,181,529, Cl. 430-626.000.

Ahiko, Kenkichi: *See—*
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.

Ahlf, Robert E., to Whirlpool Corporation. Metal surface treatment method. 4,181,540, Cl. 148-6.15R.

Ainis, Vincenzo. Aerial-stabilizer rudder for vehicles. 4,181,346, Cl. 296-1.00S.

Airscrew Howden Limited: *See—*
Letts, Robert A., 4,181,379, Cl. 308-187.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 4,181,371, Cl. 303-50.000.
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,181,147, Cl. 137-572.000.
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.

Aizawa, Masanobu, to Stanley Electric Co., Ltd. Socket terminals for a wedge base electric lamp. 4,181,390, Cl. 339-65.000.

Aizawa, Tatsuo: *See—*
Okada, Tetuya; Umeda, Tadashi; Murakami, Masahiro; and Aizawa, Tatsuo, 4,181,424, Cl. 355-8.000.

Ajinomoto: *See—*
Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, 4,181,714, Cl. 424-117.000.

Aktiebolaget Electrolux: *See—*
Ridderstrom, Goran A. H., 4,181,465, Cl. 414-590.000.

Aktiebolaget Hagglund & Soner: *See—*
Gulliksson, Sture G., 4,181,291, Cl. 254-184.000.

Aktiebolaget Leo: *See—*
Hansen, Bertil; and Holmberg, Krister, 4,181,669, Cl. 260-397.400.

Aktiebolaget Svenska Elektromagneter: *See—*
Carlsson, Hans T. H.; and Gustafsson, Leif B., 4,181,114, Cl. 123-148.0CC.

Aktiebolaget Svenska Flaktfabriken: *See—*
Bengtsson, Sune, 4,181,506, Cl. 55-48.000.

Akzo N.V.: *See—*
Burley, Joseph W.; Hutton, Ronald E.; and Oakes, Vincent, 4,181,671, Cl. 260-410.600.

Akzona Incorporated: *See—*
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, 4,181,450, Cl. 405-19.000.

Albright & Wilson Limited: *See—*
Edwards, Alfred G.; and Harris, Glyn I., 4,181,791, Cl. 528-179.000.

Alfa-Laval AB: *See—*
Dahlberg, Bengt I., 4,181,535, Cl. 127-68.000.

Allen-Bradley Company: *See—*
Selas, George J., 4,181,829, Cl. 200-33.00R.

Allen & Hanburys Limited: *See—*
Newton, Roger F.; Roberts, Stanley M.; Rainey, David K.; and Dimsdale, Michael J., 4,181,674, Cl. 260-448.80R.

Allen, James A.: *See—*
Vaughn, Walter L.; and Allen, James A., 4,181,566, Cl. 162-164.0EP.

Allen, William A.; and Chen, Pi-Fuay, to United States of America, Army. Automatic astroposition determination apparatus. 4,181,851, Cl. 250-203.00R.

Allied Chemical Corporation: *See—*
Ambasz, Wiktor J., 4,181,521, Cl. 75-53.000.
Kurtz, Bruce E., 4,181,587, Cl. 204-98.000.
Ward, Lowell G., 4,181,551, Cl. 156-199.000.

Alps Shoji Co., Ltd.: *See—*
Ubukata, Morio; and Kida, Hideki, 4,180,920, Cl. 35-9.00D.

Alsthom-Atlantique: *See—*
Maginot, Pierre; and Le Peutrec, Roger, 4,180,983, Cl. 60-657.000.

Altmann, Erik: *See—*
Kluczynski, Achim; and Altmann, Erik, 4,181,271, Cl. 242-74.000.

Aluminum Company of America: *See—*
Collins, John W., III, 4,180,961, Cl. 53-421.000.

AM International, Inc.: *See—*
Davis, William A., 4,181,078, Cl. 101-426.000.

Amaha, Mikio: *See—*
Horiuchi, Goh; Yabuuchi, Seizo; Suzuki, Satoru; and Amaha, Mikio, 4,181,742, Cl. 426-12.000.

Ambasz, Wiktor J., to Allied Chemical Corporation. Preparation of glass-forming alloys under a refining metal oxide/boron trioxide slag. 4,181,521, Cl. 75-53.000.

American Can Company: *See—*
Detroit, William J., 4,181,652, Cl. 260-124.00R.

American Cyanamid Company: *See—*
Hanifin, John W., Jr.; and Ridge, David N., 4,181,677, Cl. 260-465.00F.

American Hospital Supply Corporation: *See—*
McPhee, Charles J., 4,181,549, Cl. 156-146.000.

American Optical Corporation: *See—*
Andresen, Richard P.; Armington, Robert M.; Cannon, Robert L., III; and Griffin, Andrew J., 4,181,135, Cl. 128-703.000.
Meltzer, Robert J., 4,181,434, Cl. 356-137.000.
Whitney, Donald B.; Reilly, James A.; and Young, John M., 4,181,409, Cl. 351-167.000.

American Safety Equipment Corporation: *See—*
Hollowell, William M.; and Ziv, Avraham, 4,181,326, Cl. 280-806.000.

American Safety Razor Company: *See—*
Iten, Clemens A., 4,180,907, Cl. 30-64.000.

American Standard Inc.: *See—*
Nolden, Werner, 4,181,252, Cl. 236-12.00R.

Ammann, David W.: *See—*
Bayham, Edward L.; Williams, Ronald A.; and Ammann, David W., 4,181,140, Cl. 137-68.00R.

AMP Incorporated: *See—*
Dola, Frank P.; and Rossler, Frederick W., Jr., 4,181,384, Cl. 339-14.00R.
Lill, John F., 4,181,393, Cl. 339-98.000.
Olsson, Billy E., 4,181,386, Cl. 359-17.00F.

Ampex Corporation: *See—*
Gallo, Luigi C., 4,181,817, Cl. 178-68.000.

Anchor Wire Corporation of Tennessee: *See—*
Hogg, James W., 4,181,553, Cl. 156-211.000.

Anderson, Robert P. Adjustable rope halter and kit for assembling the same. 4,180,963, Cl. 54-24.000.

Anderson, William S., to United Technologies Corporation. Hydroxylic aromatic compounds as additives for rubber-based, composite solid propellants. 4,181,545, Cl. 149-19.900.

Ando, Yoshio: *See—*
Shirota, Yasushi; Kishimoto, Satoru; Takeshita, Kunio; and Ando, Yoshio, 4,181,430, Cl. 356-1.000.

Andresen, Richard P.; Armington, Robert M.; Cannon, Robert L., III; and Griffin, Andrew J., to American Optical Corporation. Method and apparatus for monitoring electrocardiographic waveforms. 4,181,135, Cl. 128-703.000.

Andrews, Roderic S.: *See—*
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,181,719, Cl. 424-233.000.

Anegawa, Yukio: *See—*
Murakami, Ryoichi; Anegawa, Yukio; Ishida, Minoru; and Masada, Keizi, 4,181,539, Cl. 148-6.15R.

Angstadt, Howard P.: *See—*
Butte, Walter A., Jr.; and Angstadt, Howard P., 4,181,680, Cl. 260-563.00D.

Antos, John M.: *See—*
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., 4,180,876, Cl. 4-321.000.

Aoyama, Takashi: *See—*
Kohara, Rikusei; and Aoyama, Takashi, 4,181,406, Cl. 350-357.000.

Applegate, Richard E. Vehicle wheel steering stabilizer. 4,181,318, Cl. 280-94.000.

Applied Power Inc.: *See—*
Evenson, Raymond M., 4,180,997, Cl. 72-217.000.

Applied Science Corporation: *See—*
Bullock, Richard S., 4,180,911, Cl. 433-9.000.

ARA Services, Inc.: *See—*
Oley, Leonard; and Stachnik, Joseph, 4,181,154, Cl. 137-863.000.

Arakawa, Seiichi: *See—*
Iwata, Hiroshi; Ohtani, Takeiji; Arakawa, Seiichi; and Deguchi, Seiji, 4,181,581, Cl. 260-42.480.

Arco Medical Products Company: *See—*
Kolenik, Steve A.; and Walters, Robert A., 4,181,133, Cl. 128-419.0PG.

Ardell, Richard E.: *See—*
Dannelly, Clarence C.; Ardell, Richard E.; and Paar, Gary E., 4,181,710, Cl. 424-33.000.

Ardyshev, Valentin N.: *See—*
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.

Arisaka, Katsuharu; Kobayashi, Seiichi; and Higashio, Kiyoshi, to Daicel Ltd. Method and an apparatus for conducting measurements of physical properties of cigarette filters. 4,181,007, Cl. 73-37.800.

Ariyama, Kenzo: *See—*
Higaya, Toshiaki; and Ariyama, Kenzo, 4,181,425, Cl. 355-15.000.

Armco Inc.: *See—*
Cowan, William S., 4,181,331, Cl. 285-141.000.

Armington, Robert M.: *See—*
Andresen, Richard P.; Armington, Robert M.; Cannon, Robert L., III; and Griffin, Andrew J., 4,181,135, Cl. 128-703.000.

Armstrong Cork Company: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., 4,181,497, Cl. 8-2.50A.

Armstrong Store Fixtures Corporation: *See—*
Moore, David M., 4,181,229, Cl. 211-184.000.

Arndt, Friedrich: *See—*
Kruger, Hans-Rudolf; Rusch, Reinhart; and Arndt, Friedrich, 4,181,517, Cl. 71-73.000.

Arnold, Paul W.; Scofield, William L.; Borst, Ronald W.; and Scott, Vern D., to Clay & Bailey Manufacturing Company. Venting tank closure. 4,181,238, Cl. 220-314.000.

Arriaga-Ortiz, Hector M. Industrial oven for the calcining of lime stone. 4,181,496, Cl. 432-137.000.

Arrow-Hart, Inc.: *See—*
Thomas, Robert W.; and Hovanic, Steven F., 4,181,924, Cl. 361-353.000.

Asahi Breweries, Ltd.: *See—*
Horiuchi, Goh; Yabuuchi, Seizo; Suzuki, Satoru; and Amaha, Mikio, 4,181,742, Cl. 426-12.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, 4,181,694, Cl. 264-41.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro, 4,181,413, Cl. 354-24.000.
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,181,411, Cl. 354-53.000.

Asakura, Takasuke: *See—*
Ohashi, Nozomu; Yamamuro, Okimasa; Asakura, Takasuke; and Nakagawa, Akira, 4,181,711, Cl. 428-40.000.

Asanomi, Koji: *See—*
Takemoto, Yasunori; Asanomi, Koji; and Kobayashi, Kazuo, 4,181,105, Cl. 123-117.00A.

Asao, Shuichiro: *See—*
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.

ASEA Aktiebolag: *See—*
Collin, Per H., 4,181,812, Cl. 13-35.000.

Atkinson, Gary B.: *See—*
Baglin, Elizabeth G.; Atkinson, Gary B.; and Nicks, Larry J., 4,181,630, Cl. 252-476.000.

Atkinson, Kenneth W.; and Longaker, C. D. Lowell, to Atkinson, Kenneth W. Method and apparatus for golf practice and instruction. 4,181,309, Cl. 273-186.00R.

Atlantic Richfield Company: *See—*
Crosky, Robert A., 4,181,448, Cl. 404-27.000.
Wilson, William N., 4,181,533, Cl. 106-104.000.

Atlas Copco AB: *See—*
Gustafsson, Sven H., 4,181,182, Cl. 173-23.000.

Ault, Russell L.: *See—*
Richter, C. Stephen; and Ault, Russell L., 4,181,287, Cl. 249-154.000.

Auman, John T.: *See—*
Mennucci, Donald F.; and Auman, John T., 4,181,205, Cl. 192-58.00B.

Auscoteng Pty. Ltd.: *See—*
Foley, Norman L., 4,181,577, Cl. 202-181.000.

Austin, Michael M.: *See—*
Pyeatte, Samuel C.; and Austin, Michael M., 4,181,909, Cl. 340-147.0SY.

Avalon, Max, to Honeywell Information Systems, Inc. Apparatus for cutting a segment from a strip of film and mounting the segment in a fixture. 4,180,893, Cl. 29-33.00K.

Avco Corporation: *See—*
Waddington, Clive, 4,181,043, Cl. 74-750.00B.

B. F. Goodrich Company, The: *See—*
Lehr, Marvin H., 4,181,644, Cl. 260-42.180.

B & H Manufacturing Company, Inc.: *See—*
Hoffmann, Wolfgang, 4,181,555, Cl. 156-265.000.

Babcock, William E., to RCA Corporation. Television S-correction circuit with improved linearity. 4,181,874, Cl. 315-370.000.

Babinsky, Andrew D., to Diamond Shamrock Corporation. Converting a diaphragm electrolytic cell to a membrane electrolytic cell. 4,181,592, Cl. 204-283.000.

Bader, Karl-Otto: *See—*
Blesser, Barry A.; and Bader, Karl-Otto, 4,181,820, Cl. 179-1.00J.

Baglin, Elizabeth G.; Atkinson, Gary B.; and Nicks, Larry J., to United States of America, Interior. Catalyst for synthesis of methanol. 4,181,630, Cl. 252-476.000.

Bahr, Albert. Device for dewatering sludge or the like. 4,181,616, Cl. 210-297.000.

Bailey, Wilber H., to Ivac Corporation. Drop discriminator system. 4,181,130, Cl. 128-214.00E.

Bailly-Lacresse, Jean-Francois G.; Bonzom, Albert; and Courtois, Jean C., to British Petroleum Company Limited, The. Production of lubricants. 4,181,595, Cl. 208-18.000.

Bajek, Frantisek; and Nejedly, Josef, to Elitex, Koncern Textilniho Strojirenstvi. Buttonhole bar tacker sewing machine with a device for controlling the buttonhole length terminated by a wedge bar tack. 4,181,084, Cl. 112-71.000.

Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, to Elitex, koncern textilniho strojirenstvi. Mechanism for controlling the workpiece pressure grippers of buttonhole bar tacker sewing machines. 4,181,083, Cl. 112-67.000.

Baker, Peter D.; and Luke, Douglas V., to Smiths Industries Limited. Fibre-optic cable. 4,181,397, Cl. 350-96.200.

Baker, Richard L.: *See—*
Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., 4,181,026, Cl. 73-665.000.

Baldwin, Alfred D. Pipe for drawing smoke through and extracting juice from a piece of fruit. 4,181,136, Cl. 131-171.00R.

Ball, William J., Jr.: *See—*
Kickle, Hunter L.; Ball, William J., Jr.; and Von Schanefelt, Robert, 4,181,747, Cl. 426-615.000.

Balsiger, Harold E. Rotary blade hydraulic motor with fluid bearing. 4,181,480, Cl. 418-102.000.

Balstad, Edward. Roller skate braking assembly. 4,181,227, Cl. 280-11.200.

Baltes, Hans. Method for drying laundry, and a drying cabinet for carrying out such method. 4,180,919, Cl. 34-23.000.

Baltimore Aircoil Company, Inc.: *See—*
Cates, Robert E.; and Schinner, Edward N., 4,181,691, Cl. 261-111.000.

Balukin, Richard F.; and Reiss, John R., to Westinghouse Air Brake Company. Pneumatic/electro-pneumatic brake control system with interlock circuitry for push/pull train operation. 4,181,369, Cl. 303-16.000.

Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See—*
Kraus, Thaddaus, 4,181,161, Cl. 141-8.000.

Banucci, Eugene G.: *See—*
Boldebuck, Edith M.; and Banucci, Eugene G., 4,181,641, Cl. 260-33.20R.

Barber, Gerald L.; and Comstock, Wayne, to Venture Ride Mfg. Inc.; and High-Lite Corporation. Portable illuminating tower. 4,181,929, Cl. 362-192.000.

Barlow, Raymond S., to Connor Engineering & Manufacturing, Inc. Ceiling air diffuser and induction apparatus. 4,181,253, Cl. 236-49.000.

Barnett, Ronald R., to General Motors Corporation. Occupant restraint cushion. 4,181,325, Cl. 280-739.000.

Barnowski, Henry G.: *See—*
Chandalia, Kiran B.; Preston, Frank J.; and Barnowski, Henry G., 4,181,781, Cl. 521-137.000.

Bartels, Philip R.: *See—*
Hanson, Duane E.; and Bartels, Philip R., 4,181,771, Cl. 428-327.000.

Barton, Derek H. R.; and Hesse, Robert H., to Research Institute for Medicine and Chemistry Inc. 5(3-Substituted aminopropyl)-10-trifluoromethoxy-5H-dibenz[b,f]azepines. 4,181,655, Cl. 260-239.00D.
BASF Aktiengesellschaft: *See—*
Elser, Wolfgang; Hartwig, Ernst; and Ruske, Manfred, 4,181,668, Cl. 260-377.000.
Bassett, Alvin L. Portable radial saw. 4,181,057, Cl. 83-486.100.
Bassett, Alvin L. Bench vise. 4,181,296, Cl. 269-88.000.
Bassett, James H.; and King, Paul L., to International Telephone and Telegraph Corporation. Safety clamp device and apparatus utilizing same. 4,181,194, Cl. 182-112.000.
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., to Xerox Corporation. Sample copy system for xerographic reproduction machine. 4,181,429, Cl. 355-77.000.
Batte, Christopher L. Airport runway fire control method and apparatus. 4,181,179, Cl. 169-47.000.
Baumann, Walter: *See—*
Naef, Emil, 4,181,383, Cl. 312-334.000.
Baxter Travenol Laboratories, Inc.: *See—*
Bayham, Edward L.; Williams, Ronald A.; and Ammann, David W., 4,181,140, Cl. 137-68.00R.
Bellamy, David; and Winchell, David A., 4,181,232, Cl. 215-232.000.
Garrett, Scott T.; Kulle, Lee K.; and Rudzena, William L., 4,181,245, Cl. 222-450.000.
Bayer Aktiengesellschaft: *See—*
Bomer, Bruno; Schnoring, Hildegard; and Schmidt, Rolf, 4,181,639, Cl. 260-29.6WB.
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,181,676, Cl. 260-463.000.
Clamroth, Rudolf; Loske, Hans; and Schnetger, Jochen, 4,181,023, Cl. 73-432.00R.
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,181,789, Cl. 528-73.000.
Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, 4,181,810, Cl. 568-807.000.
Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,181,782, Cl. 521-162.000.
Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, 4,181,788, Cl. 526-68.000.
Bayham, Edward L.; Williams, Ronald A.; and Ammann, David W., to Baxter Travenol Laboratories, Inc. Frangible resealable closure for a flexible tube having hold open means. 4,181,140, Cl. 137-68.00R.
Baysinger, Frank R., to Kaiser Aluminum & Chemical Corporation. Liquefied natural gas tank construction. 4,181,235, Cl. 220-5.00A.
Bazin, Valentin T.: *See—*
Borisenko, Alexandr V.; Serebryakov, Evgeny A.; Sakun, Anatoly F.; and Bazin, Valentin T., 4,181,049, Cl. 82-1.00C.
BBC Brown Boveri & Company Limited: *See—*
Schaible, Wolfgang; and Senn, Hanspeter, 4,181,841, Cl. 307-30.000.
Beach, Shirley, to Phillips Cables Limited. Process for extrusion coating of a wire with a cellular thermoplastic resin material. 4,181,647, Cl. 264-45.900.
Beardmore, John M., to General Motors Corporation. Torque converter with variable pitch stator. 4,180,977, Cl. 60-342.000.
Beaufort (Air-Sea) Equipment Limited: *See—*
Oldham, Walter, 4,180,883, Cl. 9-312.000.
Beckenbaugh, William M.; Goldman, Patricia J.; and Morton, Kim L., to Western Electric Company, Inc. Method of depositing a metal on a surface. 4,181,750, Cl. 430-414.000.
Becker, Bernard, to Kraftwerk Union Aktiengesellschaft. Device for damping vibrations in rotors of turbomachines. 4,181,038, Cl. 74-574.000.
Becker, Wolfgang, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Record carrier with safety features capable of being checked mechanically and method of checking said safety. 4,181,251, Cl. 235-451.000.
Beckman Instruments, Inc.: *See—*
Chervenka, Charles H.; and Gropper, Lee, 4,181,700, Cl. 422-102.000.
Horrocks, Donald L., 4,181,855, Cl. 250-363.00R.
Beckmann, Franz: *See—*
Weber, Heinrich; Dungs, Horst; and Beckmann, Franz, 4,181,502, Cl. 44-10.00C.
Beckwith, Elaine C. S.: *See—*
Chattha, Mohinder S.; Beckwith, Elaine C. S.; and van Oene, Henk, 4,181,784, Cl. 525-161.000.
Becton, Dickinson and Company: *See—*
Gouveia, Philip H., 4,181,233, Cl. 215-247.000.
Kippel, Edward A.; and Huston, Paul O., 4,181,511, Cl. 55-274.000.
Kippel, Edward A.; and Huston, Paul O., 4,181,512, Cl. 55-274.000.
Bednar, Miloslav: *See—*
Zalesak, Jan; and Bednar, Miloslav, 4,181,001, Cl. 72-108.000.
Beecham Group Limited: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,181,716, Cl. 424-124.000.
Beeghly, Bruce R.; and Lepley, Joseph, to Economy Engine Company, The. Hourmeter-tachometer. 4,181,883, Cl. 324-166.000.
Beermann, Ewald H., to Martor-Argentax E. H. Beermann K.G. Grooving tool. 4,180,908, Cl. 30-279.00R.
Beezley, Dale L., to United States of America, Navy. Two-phase control system. 4,181,931, Cl. 363-4.000.
Belgium Tool & Die Company: *See—*
Stroobants, Alphonse; and Cvacho, Daniel S., 4,181,050, Cl. 82-56.000.
Bell & Howell Company: *See—*
Workman, Dennis L., 4,181,822, Cl. 179-15.55R.
Bell Telephone Laboratories, Incorporated: *See—*
Bobeck, Andrew H., 4,181,978, Cl. 365-8.000.
Bobeck, Andrew H., 4,181,979, Cl. 365-20.000.
Cho, Alfred Y., 4,181,544, Cl. 148-175.000.
Falconer, David D., 4,181,888, Cl. 325-42.000.
Fogarty, Thomas N.; Harshbarger, William R.; and Porter, Roy A., 4,181,564, Cl. 156-643.000.
Marcuse, Dietrich, 4,181,433, Cl. 356-73.100.
Pirz, Frank C.; and Rabiner, Lawrence R., 4,181,821, Cl. 179-1.0SD.
Seidel, Harold, 4,181,824, Cl. 179-170.00D.
Teo, Boon K., 4,181,779, Cl. 429-199.000.
Bellamy, David; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Sealed closure for plastic container with interlocking protective outer closure. 4,181,232, Cl. 215-232.000.
Belletire, John L.: *See—*
Sarges, Reinhard; and Belletire, John L., 4,181,728, Cl. 424-273.00R.
Sarges, Reinhard; and Belletire, John L., 4,181,729, Cl. 424-273.00R.
Bellicardi, Francesco, to Edoardo Weber - Fabbrica Italiana Carburatori S.p.A. System for the control of the composition of the fuel-air mixture of an internal combustion engine. 4,181,108, Cl. 123-119.0EC.
Beloit Corporation: *See—*
Schmaeng, John F., 4,181,378, Cl. 308-36.100.
Benedyk, Joseph C., to Brunswick Corporation. Fibers, yarns and fabrics of low modulus polymer. 4,181,762, Cl. 428-97.000.
Bengtsson, Sune, to Aktiebolaget Svenska Flaktfabriken. Method for recovering concentrated sulphur dioxide from waste gases containing sulphur dioxide. 4,181,506, Cl. 55-48.000.
Benjamin, Benjamin C.; and LaVene, Leon F., to Schmelzer Corporation. Two stage vacuum break. 4,181,065, Cl. 91-167.00R.
Bensel, Joachim: *See—*
Kockott, Dieter; and Bensel, Joachim, 4,181,926, Cl. 362-33.000.
Bentz, Gerard: *See—*
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,181,522, Cl. 75-96.000.
Benysek, Bruce M., to Mohawk Data Sciences Corp. Memory access and sharing control system. 4,181,933, Cl. 364-200.000.
Beranger, Serge; and Pinhas, Henri, to Laroche Navarron S.A. Chromene derivatives useful as bronchodilators and anti-arrhythmics. 4,181,722, Cl. 424-250.000.
Bernicot, Jean B., to Vibramec S.A.R.L. Apparatus for opening disposable packaging. 4,181,461, Cl. 414-412.000.
Bernstein, Joel E. Method of alleviating pruritis. 4,181,726, Cl. 424-260.000.
Bernstein, Phillip; and Toy, Henry, to United States of America, Navy. Release assembly using separation nuts and thrusters. 4,181,062, Cl. 89-1.50F.
Bernt, Jorgen O. Internal suspension preheater for long rotary kilns. 4,181,495, Cl. 432-118.000.
Berthod, Jacques, to Commissariat a l'Energie Atomique. Spark source spectrographic analysis process and apparatus. 4,181,852, Cl. 250-286.000.
Bertone, Antonino: *See—*
Vannini, Paolo; Rivetti, Enrico; and Bertone, Antonino, 4,181,373, Cl. 303-116.000.
Bethlehem Steel Corporation: *See—*
Stauffer, Donald R.; and Stuenes, Rolf, 4,181,578, Cl. 202-239.000.
Betsuno, Ikuo, to Chubu Shiryo Kabushiki Kaisha. Automatic feeding devices for domestic animals. 4,181,097, Cl. 119-51.110.
Bhansali, Kirit J. Nickel-base wear-resistant alloy. 4,181,523, Cl. 75-171.000.
Bianchetti, Alberto: *See—*
Tricerri Zumin, Silvia; and Bianchetti, Alberto, 4,181,740, Cl. 424-274.000.
Bibbens, William H. Clutch with interlocking teeth. 4,181,210, Cl. 192-114.00T.
Binstock, Morton H., to Westinghouse Electric Corp. Coordinated control for power plant forced and induced draft fans during startup and fan speed changes. 4,181,099, Cl. 122-448.00R.
Bitting, James L.; and Tubb, Thomas L., Jr., to Ethyl Corporation. Cable stripping apparatus. 4,181,047, Cl. 81-9.510.
Bjorklund, Curt A. Purging apparatus. 4,181,262, Cl. 239-404.000.
Black, Billy E. Target release system. 4,181,911, Cl. 343-225.000.
Black Clawson Company, The: *See—*
Phelps, Richard W., 4,181,039, Cl. 74-665.0GA.
Blackburn, William J. G.: *See—*
Spikes, Roger H.; and Blackburn, William J. G., 4,180,895, Cl. 29-149.50C.
Blackmore, David M.: *See—*
Smith, Hugh D.; and Blackmore, David M., 4,180,943, Cl. 49-279.000.
Blair, Annan: *See—*
Foster, Wilbert J., 4,180,950, Cl. 52-81.000.
Blakey, Cathy L.; and Sutton, Richard C., to Eastman Kodak Company. Interpolymer protective overcoats for electrophotographic elements. 4,181,526, Cl. 430-67.000.
Blanton, James R., to Dresser Industries, Inc. Sleeve valve hydraulic jar tool. 4,181,186, Cl. 175-297.000.

Blaylock, Tommy J. Clutch throw-out bearing plate. 4,181,207, Cl. 192-98.000.

Bleibtreu, Emil: *See—*
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.

Bleiche AG Zofingen: *See—*
Stritzko, Vilem, 4,180,880, Cl. 8-154.000.

Blendax-Werke R. Schneider & Co.: *See—*
Raaf, Helmut; L'Orange, Raul; and Harth, Helmut, 4,181,621, Cl. 252-102.000.

Blesser, Barry A.; and Bader, Karl-Otto, to Franz Vertriebsgesellschaft mbH. Electric reverberation apparatus. 4,181,820, Cl. 179-1.00J.

Bloom Engineering Company, Inc.: *See—*
Hovis, James E., 4,181,491, Cl. 431-187.000.

Blossey, Daniel F.; Deshpande, Narayan V.; and Faucz, Eugene C., to Xerox Corporation. Random-dump storage buffer for moving web. 4,181,426, Cl. 355-16.000.

Blum, Holger: *See—*
Ellenberger, Willi; Blum, Holger; Muller-Zitzke, Harald; and Mascher, Ludwig, Jr., 4,181,651, Cl. 260-119.000.

Blume, Erich; and Schornig, Eberhard, to Hoechst Aktiengesellschaft. Development device for developing sheets of diazo copying material. 4,181,420, Cl. 354-299.000.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory with expander-detector arrangement. 4,181,978, Cl. 365-8.000.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory with single-level bubble functional elements. 4,181,979, Cl. 365-20.000.

Boehling, Daniel E.; and Cash, Carl L. Device for disposal of animal excrement. 4,181,451, Cl. 405-128.000.

Boehmer, Noel A. Apparatus for analyzing the movement of a device to be manipulated. 4,181,310, Cl. 273-186.00A.

Boehringer Mannheim GmbH: *See—*
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, 4,181,575, Cl. 435-11.000.

Boeing Company, The: *See—*
Leak, John; and Miller, Aaron, Jr., 4,181,024, Cl. 73-660.000.

Boeke, Jan. In-line pH and pIon controller. 4,181,951, Cl. 364-499.000.

Boldebuck, Edith M.; and Banucci, Eugene G., to General Electric Company. Polyetheramide-acid-imide solution and process for preparation thereof. 4,181,641, Cl. 260-33.20R.

Bolton, Jimmie B., to Smith International, Inc. Apparatus for tempering the weld between a tool joint connector and a drill pipe tube. 4,181,845, Cl. 219-8.500.

Bomer, Bruno; Schnoring, Hildegard; and Schmidt, Rolf, to Bayer Aktiengesellschaft. Polymer solutions. 4,181,639, Cl. 260-29.6WB.

Bone, Phillip R., to EMI Limited. Arrangements for detectors of radiation. 4,181,856, Cl. 250-366.000.

Bonzom, Albert: *See—*
Bailly-Lacresse, Jean-Francois G.; Bonzom, Albert; and Courtois, Jean C., 4,181,595, Cl. 208-18.000.

Boon, Daniel A.; Jones, R. Larry; and Shelton, Naaman, Jr., to Jones Plastic & Engineering Corporation. Lazy Susan assembly having an adjustable alignment mechanism. 4,181,037, Cl. 74-569.000.

Booth, Charles L., to Du Pont de Nemours, E. I., and Company. Sodium ion conducting sodium aluminum phosphate glasses. 4,181,579, Cl. 204-1.00R.

Borg-Warner Corporation: *See—*
Ross, Louis, 4,181,479, Cl. 418-61.00B.

Borisenko, Alexandr V.; Serebryakov, Evgeny A.; Sakun, Anatoly F.; and Bazin, Valentin T. Method of machining solids of revolution by rotary cutting tools and a toolholder for carrying same into effect. 4,181,049, Cl. 82-1.00C.

Borner, Gerhard: *See—*
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.

Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., to Polaroid Corporation. 3-Substituted benz[-d]isothiazole-1,1-dioxides. 4,181,660, Cl. 548-110.000.

Borst, Ronald W.: *See—*
Arnold, Paul W.; Scofield, William L.; Borst, Ronald W.; and Scott, Vern D., 4,181,238, Cl. 220-314.000.

Borsuk, Leslie M.; and Corrales, Patrick G., to International Telephone and Telegraph Corporation. Single optical fiber connector. 4,181,402, Cl. 350-96.210.

Bouvard, Andre; and Mahieu, Jean-Rene, to Societe Lignes Telegraphiques et Telephoniques. Quick release connector for waveguide circuits. 4,181,905, Cl. 333-255.000.

Bowden, John W.: *See—*
Stadler, Gary D.; Chambers, Patrick H.; and Bowden, John W., 4,181,835, Cl. 200-82.00E.

Bowman, Vincent G., to Faultless-Doerner Manufacturing Inc. Bell assembly for a chair support. 4,181,280, Cl. 248-405.000.

Boyajian, John D.; and Weinberger, Paul A., to Combustion Engineering, Inc. Post-LOCA core flushing system. 4,181,570, Cl. 176-38.000.

Boyle, John M.: *See—*
West, Gaylon L.; and Boyle, John M., 4,181,879, Cl. 324-326.000.

Bozarth, Theodore B.: *See—*
Elias, Jack; and Bozarth, Theodore B., 4,181,842, Cl. 307-66.000.

Brachthauser, Karl-Heinz: *See—*
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbeck, Fritz; and Brachthauser, Karl-Heinz, 4,181,796, Cl. 536-1.000.

Bradley, Arthur S. Golf tee. 4,181,300, Cl. 273-33.000.

Brakebill, Harold G., to Robertshaw Controls Company. Engine control system and a differential vacuum regulator therefor or the like. 4,181,106, Cl. 123-117.00A.

Brand, Dieter; and Pape, Fritz G., to Stiebel Eltron GmbH & Co. KG. Skate Board. 4,181,316, Cl. 280-11.200.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,181,374, Cl. 308-6.00C.
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.

Braswell, John W. Water softening system. 4,181,605, Cl. 210-19.000.

Brauch, Robert B.; and Pepe, Russell, to Singer Company, The. Method for initially positioning a traveling buttonhole presser foot. 4,181,087, Cl. 112-264.100.

Brendel, Albert E., to Maatschappij van Berkel's Patent N.V. Load cell. 4,181,011, Cl. 73-141.00A.

Brenner, Douglas; and Lundberg, Robert D., to Exxon Research & Engineering Co. Thermoplastic ionomer foams. 4,181,780, Cl. 521-93.000.

Bridger, Robert F.: *See—*
Yan, Tsoung-Yuan; and Bridger, Robert F., 4,181,597, Cl. 208-46.000.

Bridges, Charles D.: *See—*
McGee, John K.; Bridges, Charles D.; and Brown, Robert T., 4,181,175, Cl. 166-85.000.

Briggs & Stratton Corporation: *See—*
Seilenbinder, Richard W., 4,181,206, Cl. 192-0.084.

Bristol-Myers Company: *See—*
Kawaguchi, Hiroshi; Tsukiura, Hiroshi; and Tomita, Koji, 4,181,574, Cl. 435-77.000.
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 4,181,797, Cl. 536-10.000.

British Petroleum Company Limited, The: *See—*
Bailly-Lacresse, Jean-Francois G.; Bonzom, Albert; and Courtois, Jean C., 4,181,595, Cl. 208-18.000.
Steenhorst, Johannes, 4,181,614, Cl. 210-221.00P.

Brody, Kenneth I. Method and apparatus for fastening object to clay tile roof. 4,180,958, Cl. 52-747.000.

Brook, David L., to S. G. Brown Limited, a part interest. Gyroscopic instruments. 4,180,916, Cl. 33-318.000.

Brooks, Donald E.: *See—*
United States of America, National Aeronautics and Space Administration; and Brooks, Donald E., 4,181,589, Cl. 204-180.00R.

Brooks Shoe Manufacturing Co., Inc.: *See—*
Subotnick, Steven I., 4,180,924, Cl. 36-129.000.

Brown, Boveri & Cie: *See—*
Fischer, Albert G., 4,181,753, Cl. 427-64.000.

Brown, Robert T.: *See—*
McGee, John K.; Bridges, Charles D.; and Brown, Robert T., 4,181,175, Cl. 166-85.000.

Browne, Thomas E., Jr., to Westinghouse Electric Corp. Compressed-gas circuit interrupter having insulated contacts. 4,181,837, Cl. 200-148.00R.

Bruckner, Dietrich: *See—*
Holle, Werner; and Bruckner, Dietrich, 4,181,412, Cl. 354-23.00R.

Bruel & Kjaer Industri A/S: *See—*
Jensen, Jorgen, 4,180,892, Cl. 29-25.350.

Brumlick, George C.; and Lemelson, Jerome H. Food flavorings and methods for producing same. 4,181,743, Cl. 426-241.000.

Brumlik, George C., to Ingrip Fasteners, Inc. Linear element with grafted nibs and method therefor. 4,180,890, Cl. 24-204.000.

Brunet, Maurice: *See—*
Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice, 4,180,946, Cl. 51-134.50R.

Brunswick Corporation: *See—*
Benedyk, Joseph C., 4,181,762, Cl. 428-97.000.

Buccigross, Henry L.: *See—*
Doggett, Roger H.; and Buccigross, Henry L., 4,181,557, Cl. 156-331.000.

Bucher, John H.; and Paliwoda, Eugene J., to Jones & Laughlin Steel Corporation. Free machining high sulfur strand cast steel. 4,181,524, Cl. 75-123.00G.

Buck, Ronald G., to Litton Systems, Inc. Method of browning foods in a microwave oven. 4,181,744, Cl. 426-233.000.

Buckman Laboratories, Inc.: *See—*
Fenyes, Joseph G. E.; and Pera, John D., 4,181,806, Cl. 549-6.000.

Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., to Armstrong Cork Company. Process for shading during the vapor phase dyeing of carpet. 4,181,497, Cl. 8-2.50A.

Bullock, Greg A., to Du Pont de Nemours, E. I., and Company. Naphthalene miticides. 4,181,741, Cl. 424-311.000.

Bullock, Richard S., to Applied Science Corporation. Method for direct bonding of orthodontic structures to teeth using flouride pretreatment. 4,180,911, Cl. 433-9.000.

Bulson, Walter T.: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., 4,181,497, Cl. 8-2.50A.

Bumpus, Gary, to Newland, Michael D., a part interest. Children's furniture piece. 4,181,352, Cl. 297-3.000.

Bundy, Francis P.: *See—*
De Vries, Robert C.; Bundy, Francis P.; and Wentorf, Robert H., Jr., 4,181,505, Cl. 51-307.000.

Bunker Ramo Corporation: *See—*
Nijman, John P., 4,180,904, Cl. 29-749.000.

Bunn, Carl H. Siphon motor. 4,180,976, Cl. 60-325.000.
Burchette, Robert L., Jr. Dye tube. 4,181,274, Cl. 242-118.110.
Burdick Corporation, The: *See*—
Dominy, Francis I.; Partridge, Leslie W.; and Peltola, Veikko K., 4,181,004, Cl. 73-1.0DV.
Burg, Karlheinz: *See*—
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, 4,181,685, Cl. 525-402.000.
Burkl, Erich: *See*—
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.
Burley, Joseph W.; Hutton, Ronald E.; and Oakes, Vincent, to Akzo N.V. Novel organotin stabilizer compositions. 4,181,671, Cl. 260-410.600.
Burnitte, John E.: *See*—
Cofer, Daniel B.; Chia, Enrique C.; Burnitte, John E.; and Kaltenberg, Theodor W., 4,181,091, Cl. 118-63.000.
Burroughs Corporation: *See*—
Casey, John L., 4,181,972, Cl. 364-900.000.
Feeser, Walter E.; and Gerhold, Mark L. C., 4,181,935, Cl. 364-200.000.
Hill, Terence A., 4,180,990, Cl. 64-30.00R.
Burroughs Wellcome Co.: *See*—
Cowsar, Donald R.; and Harrison, Steadman D., Jr., 4,181,500, Cl. 23-230.00B.
Burrows, Kenneth; and Hiscutt, Robert, to Saunders-Roe Developments Limited. Transparent instrument cover and instrument incorporating same. 4,181,925, Cl. 362-29.000.
Burry, Arthur A. Pantograph machine. 4,181,063, Cl. 409-88.000.
Burton, Robert S., III, to Occidental Oil Shale, Inc. Liquid seal for production level bulkhead for in situ oil shale retort. 4,181,362, Cl. 299-2.000.
Burton, Robert S., III: *See*—
Ridley, Richard D.; and Burton, Robert S., III, 4,181,361, Cl. 299-2.000.
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, to Hoechst Aktiengesellschaft. Sheet-like structure of polyurethane, which is capable of absorbing water vapor and transmitting water vapor. 4,181,637, Cl. 260-16.000.
Buschmann, Gerhard; Thievessen, Karl; Weiss, Peter; and Reitter, Werner, to Jagenberg-Werke Aktiengesellschaft. Apparatus for synchronizing the speeds of two webs of goods. 4,181,847, Cl. 235-92.0CC.
Bushee, Joseph J.: *See*—
Wasserman, George; and Bushee, Joseph J., 4,180,960, Cl. 53-403.000.
Butte, Walter A., Jr.; and Angstadt, Howard P., to Suntech, Inc. Hydrogenation of aromatic amines. 4,181,680, Cl. 260-563.00D.
Butterworth, Dennis: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,181,716, Cl. 424-124.000.
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the preparation of dialkyl carbonates. 4,181,676, Cl. 260-463.000.
Bylsma, Simon. Fluid pressure regulator valve unit for a fluid delivery system. 4,181,288, Cl. 251-133.000.
C. Keller GmbH u. Co. KG: *See*—
Ketteler, Otto; and Gielsok, Hans-Peter, 4,181,269, Cl. 242-65.000.
Cairati, Luciano; and di Fiore, Lucio, to Euteco S.p.A. Catalyst for the oxidation of methanol to formaldehyde and a method of preparing the catalyst. 4,181,629, Cl. 252-458.000.
Calise, Carl M. Dial-a-Metric. 4,181,090, Cl. 116-309.000.
Camacho, Salvador L., to Technology Application Services Corp. Method for the gasification of carbonaceous matter by plasma arc pyrolysis. 4,181,504, Cl. 48-197.00R.
Cameron, Russell J.: *See*—
Russell, Neil E.; Cameron, Russell J.; Zbell, Richard P.; and Schmaltz, Lloyd L., 4,181,148, Cl. 137-596.160.
Cameto, Leon R.; and Edmund, John R., to MistO_2Gen Equipment Company. Infant hood. 4,181,129, Cl. 128-205.260.
Cammack, Kurt B. Unitary panel multiple frequency range speaker system. 4,181,819, Cl. 179-1.0GA.
Campbell, Kenneth, to Campbell, Miriam N. Radially curved axial cross-sections of tips and sides of diffuser vanes. 4,181,467, Cl. 415-207.000.
Campbell, Miriam N.: *See*—
Campbell, Kenneth, 4,181,467, Cl. 415-207.000.
Campbell, William T.: *See*—
Krene, Joseph I.; and Campbell, William T., 4,181,307, Cl. 273-183.00A.
Camph Engineering Company AB: *See*—
Camph, Sven E.; and Holmgren, Bertil K. A., 4,180,898, Cl. 29-402.070.
Camph, Sven E.; and Holmgren, Bertil K. A., to Camph Engineering Company AB. Method of replacing brake force transmission parts in vehicle wheel brakes. 4,180,898, Cl. 29-402.070.
Cannon, Robert L., III: *See*—
Andresen, Richard P.; Armington, Robert M.; Cannon, Robert L., III; and Griffin, Andrew J., 4,181,135, Cl. 128-703.000.
Canon Kabushiki Kaisha: *See*—
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Ohtaki, Syohei; Kondo, Keiko; Nakamura, Zenzo; and Okuno, Youichi, 4,181,416, Cl. 354-106.000.
Sugiura, Yoji; Tezuka, Nobuo; Yoshikawa, Ryoichi; and Masanori, Uchidoi, 4,181,417, Cl. 354-152.000.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Capdeboscq, Bernard, to S.A. Martin. Device for synchronized introduction of sheets into a treatment machine. 4,181,298, Cl. 271-5.000.
Carbos, AG: *See*—
Dahlgren, Stig A., 4,181,667, Cl. 260-347.900.
Carden, Joseph A., Jr.; and McKinney, Ray, Jr., to Monsanto Company. Lactam terpolymer membranes. 4,181,606, Cl. 210-22.00A.
Cardiac Medical Sciences Corp.: *See*—
Hatton, John; and Grenier, Raymond P., 4,181,839, Cl. 250-505.000.
Carl Freudenberg, Firma: *See*—
Schuhmacher, Gunter; Fottinger, Walter; Graber, Adolf; and Fahrbach, Erich, 4,181,770, Cl. 428-260.000.
Carl Still, Firma: *See*—
Weber, Heinrich; Dungs, Horst; and Beckmann, Franz, 4,181,502, Cl. 44-10.00C.
Carl Still Recklinghausen, Firma: *See*—
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, 4,181,706, Cl. 423-237.000.
Carlin, William W., to PPG Industries, Inc. Cathode electrocatalyst. 4,181,586, Cl. 204-98.000.
Carlson, Richard C.; and Van Vleet, Gary R. Portable traction device. 4,181,125, Cl. 128-75.000.
Carlsson, Hans T. H.; and Gustafsson, Leif B., to Aktiebolaget Svenska Elektromagneter. Circuit arrangement for electronic ignition apparatus. 4,181,114, Cl. 123-148.0CC.
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., to General Motors Corporation. Drive and storage drum for an antenna cable. 4,181,268, Cl. 242-54.00A.
Carpenter, William T., to National Drying Machinery Co. Gravity type carrier mechanism. 4,181,215, Cl. 198-483.000.
Carroll Products, Inc.: *See*—
Mecca, Sebastian B., 4,181,804, Cl. 548-311.000.
Carter, Woodward C., II, to Westinghouse Electric Corp. Adaptive priority determination power demand control method. 4,181,950, Cl. 364-492.000.
Casey, John L., to Burroughs Corporation. Means and methods for automatic hyphenating words. 4,181,972, Cl. 364-900.000.
Casey, Richard G.; Langdon, Glen G., Jr.; Mantey, Patrick E.; and Williams, Robin, to International Business Machines Corporation. Method and means for minimizing error between the manual digitizing of points and the actual location of said points on an electronic data entry surface. 4,181,952, Cl. 364-515.000.
Cash, Carl L.: *See*—
Boehling, Daniel E.; and Cash, Carl L., 4,181,451, Cl. 405-128.000.
Casio Computer Co., Ltd.: *See*—
Yanagawa, Mikio, 4,181,963, Cl. 364-705.000.
Casler, William A.; and Saurenman, Phillip E., to Clamp Mfg. Co., Inc. Clamping means and tool for making it. 4,181,392, Cl. 339-95.00R.
Cataldo, Roy S., to General Motors Corporation. Chain for a V-drive arrangement. 4,181,031, Cl. 74-234.000.
Caterpillar Tractor Co.: *See*—
Grawey, Charles E.; Untz, Robert W.; and Koch, Keith E., 4,181,169, Cl. 152-404.000.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,482, Cl. 425-28.00R.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,488, Cl. 425-577.000.
Klett, Gene R.; and Lanz, William E., 4,180,926, Cl. 37-142.00R.
Landen, Ernest W., 4,181,144, Cl. 137-484.400.
Muller, Thomas P., 4,181,337, Cl. 292-271.000.
Ostrowski, Richard C., 4,180,918, Cl. 34-13.000.
Richardson, Warner G., 4,180,925, Cl. 37-126.0AE.
Weber, John R., 4,181,478, Cl. 418-51.000.
Cates, Robert E.; and Schinner, Edward N., to Baltimore Aircoil Company, Inc. U-Bar Fill. 4,181,691, Cl. 261-111.000.
CBS Inc.: *See*—
Weber, Christopher M., 4,181,059, Cl. 84-1.240.
CDC Chemical Corporation: *See*—
Cort, J. George, 4,181,255, Cl. 239-54.000.
Cerberus AG: *See*—
Tresch, Erwin; and Horvath, Zoltan, 4,181,439, Cl. 356-338.000.
Cerekas, Allen, to Cubic Western Data. Magnetic ticket encoding transport. 4,181,920, Cl. 360-88.000.
Cerf, Donald B.; and Dreibus, Perry J. Self draining seal. 4,181,314, Cl. 277-205.000.
Chaborski, Hoiko, to MITEC-Moderne Industrietechnik GmbH. Laser distance measuring apparatus. 4,181,431, Cl. 356-5.000.
Chadwick, Curt H.: *See*—
Tajnai, Joseph D.; Chadwick, Curt H.; and Radecki, Dan J., 4,181,900, Cl. 331-94.50P.
Chaikin, Neal S. Waterproof prosthetic foot and method of making same. 4,180,872, Cl. 3-7.000.
Chambers, Patrick H.: *See*—
Stadler, Gary D.; Chambers, Patrick H.; and Bowden, John W., 4,181,835, Cl. 200-82.00E.
Chammah, Georges A. Electric dictionary. 4,180,933, Cl. 40-471.000.
Chandalia, Kiran B.; Preston, Frank J.; and Barnowski, Henry G., to Olin Corporation. In-situ polyvinyl grafting of polyurethanes. 4,181,781, Cl. 521-137.000.
Chang, Robin L.: *See*—
Krauss, Dale A.; and Chang, Robin L., 4,181,947, Cl. 364-478.000.
Chapa, Abel A., Sr. Chalupa frying utensil. 4,181,073, Cl. 99-416.000.

Chase Bag Company: *See*—
Porter, James F., 4,181,069, Cl. 93-35.00R.

Chattha, Mohinder S., to Ford Motor Company. High solids coating composition adapted for use as automotive topcoat—4. 4,181,783, Cl. 525-161.000.

Chattha, Mohinder S.; Beckwith, Elaine C. S.; and van Oene, Henk, to Ford Motor Company. High solids coating composition adapted for use as automotive topcoat—1. 4,181,784, Cl. 525-161.000.

Chattha, Mohinder S.; Siwiec Beckwith, Elaine C.; and van Oene, Henk, to Ford Motor Company. High solids coating composition adapted for use as automotive topcoat- 2. 4,181,785, Cl. 525-161.000.

Chauvel, Bernard: *See*—
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,181,618, Cl. 252-51.50A.

Chellis, Fred F., to Helix Technology Corporation. Cryogenic apparatus having means to coordinate displacer motion with fluid control means regardless of the direction of rotation of the drive shaft. 4,180,984, Cl. 62-6.000.

Chemische Werke Huels, Aktiengellschaft: *See*—
Maahs, Gunther; Rombusch, Konrad; and Zaar, Wolfgang, 4,181,790, Cl. 526-143.000.

Chen, Pi-Fuay: *See*—
Allen, William A.; and Chen, Pi-Fuay, 4,181,851, Cl. 250-203.00R.

Chermin, Hubertus M. J., to U.S. Philips Corporation. Starter for igniting a gas and/or vapor discharge lamp. 4,181,872, Cl. 315-106.000.

Chervenka, Charles H.; and Gropper, Lee, to Beckman Instruments, Inc. Centrifuge tube sequential fractionator. 4,181,700, Cl. 422-102.000.

Chester, Arthur W., to Mobil Oil Corporation. Conversion of carbon monoxide. 4,181,600, Cl. 208-113.000.

Chester, Dwight H. Method of fabricating honeycomb heat exchanger. 4,180,897, Cl. 29-157.30A.

Chevron Research Company: *See*—
Gumerman, Raymond J., 4,181,705, Cl. 423-235.000.
Jensen, Harbo P., 4,181,596, Cl. 208-11.00R.
Miller, Stephen J.; and Hughes, Thomas R., 4,181,599, Cl. 208-79.000.
Rosenthal, Leo; Isaacson, Leonard M.; and Ziebarth, John A., 4,181,954, Cl. 364-520.000.
Sweeney, W. Alan, 4,181,662, Cl. 260-326.5FN.

Chia, Enrique C.: *See*—
Cofer, Daniel B.; Chia, Enrique C.; Burnitte, John E.; and Kaltenberg, Theodor W., 4,181,091, Cl. 118-63.000.

Chicago Bridge & Iron Company: *See*—
Kenyon, John W.; Shockley, Lestle R.; and Van Niel, Paul R., 4,181,237, Cl. 220-71.000.

Ching, Michael T. S.: *See*—
Collins, Michael J.; and Ching, Michael T. S., 4,181,976, Cl. 364-900.000.

Cho, Alfred Y., to Bell Telephone Laboratories, Incorporated. Molecular beam method for processing a plurality of substrates. 4,181,544, Cl. 148-175.000.

Cholat-Serpoud, Gerard; and Legrand, Maurice, to Skis Rossignol S.A. Club Rossignol S.A. Societe Anonyme. Tennis racket. 4,181,301, Cl. 273-73.00C.

Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, to Carl Still Recklinghausen, Firma. Method and apparatus for decomposing ammonia fumes having a high hydrogen sulfide content. 4,181,706, Cl. 423-237.000.

Christensen, Burton G.; and Firestone, Raymond A., to Merck & Co., Inc. Carboxyl derivatives of thienamycin. 4,181,733, Cl. 424-274.000.

Chu, Joseph Y. C.; Schank, Richard L.; and Tutihasi, Simpei, to Xerox Corporation. Adhesive generator overcoated photoreceptors. 4,181,772, Cl. 430-58.000.

Chubu Shiryo Kabushiki Kaisha: *See*—
Betsuno, Ikuo, 4,181,097, Cl. 119-51.110.

Chwalek, Vincent P.; and Olson, Richard M., to CPC International Inc. Combined dry-wet milling process for refining corn. 4,181,748, Cl. 426-623.000.

Ciba-Geigy Corporation: *See*—
Green, George E., 4,181,807, Cl. 560-52.000.
Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, 4,181,499, Cl. 8-26.000.
Kreibich, Ursula; and Schmid, Rolf, 4,181,643, Cl. 260-40.00R.

Cieslak, Leonard K.: *See*—
Cieslak, Stanley; and Cieslak, Leonard K., 4,180,922, Cl. 36-2.600.

Cieslak, Stanley; and Cieslak, Leonard K. Boot warmer. 4,180,922, Cl. 36-2.600.

Cincinnati Milacron Inc.: *See*—
Schmidt, Dieter H.; and Garman, Dean H., 4,180,947, Cl. 51-326.000.

Cincotta, Louis: *See*—
Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., 4,181,660, Cl. 548-110.000.

Cipu, George. Reversible vibrator, bowl feeder with angled spring supports. 4,181,216, Cl. 198-757.000.

Citizen Watch Company Limited: *See*—
Miyaka, Kenji; and Noro, Hisao, 4,181,563, Cl. 156-643.000.

Cla-Val Co.: *See*—
Ensign, Harold W., 4,181,151, Cl. 137-625.280.

Claber S.p.A.: *See*—
Roman, Gian F., 4,181,447, Cl. 403-4.000.

Clamp Mfg. Co., Inc.: *See*—
Casler, William A.; and Saurenman, Phillip E., 4,181,392, Cl. 339-95.00R.

Clamroth, Rudolf; Loske, Hans; and Schnetger, Jochen, to Bayer Aktiengesellschaft. Apparatus for short-duration tests for determining the flowability of powders. 4,181,023, Cl. 73-432.00R.

Clark Equipment Company: *See*—
Frost, Barry L., 4,181,041, Cl. 74-687.000.
Williamson, William A., 4,181,009, Cl. 73-61.400.

Clark, Gary T., to Eastman Kodak Company. Disperse dyes from 2-halo-4,6-dinitroaniline and 2(2'-alkoxy-5'-alkanoylaminoanilino)alkanes. 4,181,653, Cl. 260-207.000.

Clark, Ronald G., to Synergetics, Inc. Mobile computerized tomography unit. 4,181,347, Cl. 296-1.00R.

Clarke, Clifford R. Ladder lock. 4,181,195, Cl. 182-230.000.

Clay & Bailey Manufacturing Company: *See*—
Arnold, Paul W.; Scofield, William L.; Borst, Ronald W.; and Scott, Vern D., 4,181,238, Cl. 220-314.000.

Clay, Robert B. Water resistant blasting agent and method of use. 4,181,546, Cl. 149-21.000.

Clemens, Lawrence M.: *See*—
Martens, John A.; Clemens, Lawrence M.; and Zigman, Alvin R., 4,181,752, Cl. 427-54.100.

Clifford, Douglas M.: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.

Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Herbert, Lesley D., 4,181,688, Cl. 525-390.000.
Wilson, Raymond G., 4,181,360, Cl. 299-1.000.

Coats Company, Inc., The: *See*—
Price, Joseph C.; and Wood, John F, 4,181,170, Cl. 157-1.100.

Coccetti, Silvano: *See*—
Murari, Bruno; and Coccetti, Silvano, 4,181,878, Cl. 323-94.00R.

Cofer, Daniel B.; Chia, Enrique C.; Burnitte, John E.; and Kaltenberg, Theodor W., to Southwire Company. Apparatus for pickling cast rod. 4,181,091, Cl. 118-63.000.

Cohen, Edwin, to Singer Company, The. Head-up viewing display. 4,181,405, Cl. 350-331.000.

Cohen, Seymour. Perforated stencil sign panel. 4,180,934, Cl. 40-580.000.

Cole, John J.: *See*—
Piffath, Rodney S.; and Cole, John J., 4,181,493, Cl. 431-344.000.

Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotics. 4,181,716, Cl. 424-124.000.

Colgate-Palmolive Company: *See*—
Colodney, Daniel; and Cordon, Martin, 4,181,633, Cl. 252-525.000.
Dillarstone, Alan; and Straw, Alan, 4,181,623, Cl. 252-143.000.
Pedergrass, John E.; and Wichman, Cynthia A., 4,180,869, Cl. 2-240.000.
Schebece, Frank, 4,181,632, Cl. 252-542.000.

Collin, Per H., to ASEA Aktiebolag. Iron oxide melt reduction furnace and method. 4,181,812, Cl. 13-35.000.

Collins, John W., III, to Aluminum Company of America. Induction heat sealed containers. 4,180,961, Cl. 53-421.000.

Collins, Michael J.; and Ching, Michael T. S., to Raytheon Company. Bit reversing apparatus. 4,181,976, Cl. 364-900.000.

Colodney, Daniel; and Cordon, Martin, to Colgate-Palmolive Company. Liquid scouring cream containing calcium metasilicate. 4,181,633, Cl. 252-525.000.

Combustion Engineering, Inc.: *See*—
Boyajian, John D.; and Weinberger, Paul A., 4,181,570, Cl. 176-38.000.
Halloran, John J., Jr., 4,181,264, Cl. 241-117.000.
Harris, Lewis K.; and Pearse, Howard J., 4,181,021, Cl. 73-317.000.
McGee, John K.; Bridges, Charles D.; and Brown, Robert T., 4,181,175, Cl. 166-85.000.

Commissariat a l'Energie Atomique: *See*—
Berthod, Jacques, 4,181,852, Cl. 250-286.000.
Pottier, Jacques, 4,181,894, Cl. 328-233.000.

Communications Satellite Corporation: *See*—
Cooperman, Richard S., 4,181,886, Cl. 325-4.000.

Compton, Leslie E., to Occidental Research Corporation. Controlling shale oil pour point. 4,181,177, Cl. 166-256.000.

Comstock, Wayne: *See*—
Barber, Gerald L.; and Comstock, Wayne, 4,181,929, Cl. 362-192.000.

Conner, William R., Jr., to Stahl-Urban Company. Automatic sewing apparatus. 4,181,085, Cl. 112-121.120.

Connor Engineering & Manufacturing, Inc.: *See*—
Barlow, Raymond S., 4,181,253, Cl. 236-49.000.

Container Corporation of America: *See*—
Zicko, James A., 4,181,220, Cl. 206-315.00R.

Conti, Allen C. Method for pulling cable and conducting mixed concrete. 4,181,137, Cl. 137-13.000.

Cook, Kenneth J.: *See*—
Juengel, Richard O.; and Cook, Kenneth J., 4,181,958, Cl. 364-560.000.

Cooley, Denton A.: *See*—
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,180,896, Cl. 29-157.00R.

Cooperman, Richard S., to Communications Satellite Corporation. Distribution control unit providing simultaneous hybrid FDMA and SS-TDMA operation in a transitional satellite switched system. 4,181,886, Cl. 325-4.000.

Copagnie d'Etudes et de Realisation de Cybernetique Industrielle: *See*—
Heitz, Pierre, 4,181,160, Cl. 141-1.000.

Cordell Engineering, Inc.: *See*—
Kitrosser, Samuel, 4,181,421, Cl. 354-321.000.
Cordon, Martin: *See*—
Colodney, Daniel; and Cordon, Martin, 4,181,633, Cl. 252-525.000.
Cork, Gordon H.: *See*—
Helm, Homer E., 4,181,329, Cl. 285-3.000.
Corke, Nicholas T., to N.V. Raychem S.A. Adhesive. 4,181,775, Cl. 428-348.000.
Cornelius Company, The: *See*—
Zygiel, Alfred E., deceased; and Zygiel, Mary E., executrix, 4,181,242, Cl. 222-1.000.
Cornell, Charles R., to Eaton Corporation. Anti-stall control for electrical hydrostatic transmission control system. 4,180,979, Cl. 60-395.000.
Cornell Research Foundation, Inc.: *See*—
Ginos, James Z.; and Cotzias, George C., 4,181,738, Cl. 424-330.000.
Corrales, Patrick G.: *See*—
Borsuk, Leslie M.; and Corrales, Patrick G., 4,181,402, Cl. 350-96.210.
Cort, J. George, to CDC Chemical Corporation. Odor filtering device. 4,181,255, Cl. 239-54.000.
Costruzioni Meccaniche Lonati S.p.A.: *See*—
Lonati, Francesco, 4,180,991, Cl. 66-14.000.
Cotti, Gino: *See*—
Croci, Marco; and Cotti, Gino, 4,181,656, Cl. 260-239.100.
Cotzias, George C.: *See*—
Ginos, James Z.; and Cotzias, George C., 4,181,738, Cl. 424-330.000.
Count Numbering Machine, Inc.: *See*—
Maitland, Roy, 4,181,560, Cl. 156-542.000.
Courtaulds Limited: *See*—
White, Breen C., 4,180,968, Cl. 57-239.000.
Courtois, Jean C.: *See*—
Bailly-Lacresse, Jean-Francois G.; Bonzom, Albert; and Courtois, Jean C., 4,181,595, Cl. 208-18.000.
Covington, Wayne F.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Cowan, William S., to Armco Inc. Hanger apparatus for suspending pipes. 4,181,331, Cl. 285-141.000.
Cowsar, Donald R.; and Harrison, Steadman D., Jr., to Burroughs Wellcome Co. Chemical testing systems. 4,181,500, Cl. 23-230.00B.
Cox, Don C., to Otis Engineering Corporation. Quick disconnect rotary valve coupling. 4,181,149, Cl. 137-614.020.
Cox, Raymond W., to Johnson & Johnson Baby Products Company. Pre-moist tissue dispensing container. 4,181,218, Cl. 206-205.000.
CPC International Inc.: *See*—
Chwalek, Vincent P.; and Olson, Richard M., 4,181,748, Cl. 426-623.000.
Headley, Verl E., 4,181,534, Cl. 127-67.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-6,7-disubstituted-5-acyl benzofuran-2-carboxylic acids. 4,181,727, Cl. 424-270.000.
Cragoe, Edward J., Jr.: *See*—
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,181,661, Cl. 548-195.000.
Creasey, Roger H.: *See*—
Perry, Dennis A.; and Creasey, Roger H., 4,181,828, Cl. 200-18.000.
Croci, Marco; and Cotti, Gino, to Glaxo Group Limited. Manufacture of semi-synthetic penicillin antibiotics. 4,181,656, Cl. 260-239.100.
Crosby, Ivan K., to University of Virginia Alumni Patents Foundation, The. Apparatus for cardiac surgery and treatment of cardiovascular disease. 4,181,123, Cl. 128-6.000.
Crosfield Exectronics Limited: *See*—
Dalton, Brian L., 4,181,077, Cl. 101-401.100.
Crosky, Robert A., to Atlantic Richfield Company. Combination roadway and pipeline way in permafrost regions. 4,181,448, Cl. 404-27.000.
Crowley, James D.: *See*—
Weller, Joseph F.; Crowley, James D.; and Giallorenzi, Thomas G., 4,181,904, Cl. 333-153.000.
Crum, Gerald, to Nordson Corporation. Safety guard for an airless spray nozzle. 4,181,261, Cl. 239-288.500.
Cubic Western Data: *See*—
Cerekas, Allen, 4,181,920, Cl. 360-88.000.
Cuccio, John D.: *See*—
La Fata, John E.; and Cuccio, John D., 4,180,938, Cl. 46-6.000.
Cumming, Richard J.; and Stephenson, Warren R., to General Motors Corporation. Closure electrical contact assembly. 4,181,833, Cl. 200-61.620.
Cunningham, Ronald J. Rotary heating apparatus. 4,181,846, Cl. 219-10.49A.
Curley, John L.: *See*—
Lemay, Richard A.; and Curley, John L., 4,181,974, Cl. 364-900.000.
Curnow, John M.: *See*—
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,181,000, Cl. 72-60.000.
Currah, Ian E., to National Research Development Corporation. Apparatus for dispensing seeds from liquid suspension. 4,181,241, Cl. 221-211.000.
Cvacho, Daniel S.: *See*—
Stroobants, Alphonse; and Cvacho, Daniel S., 4,181,050, Cl. 82-56.000.
Cywinski, Norbert F., to El Paso Products Company. Production of tertiary-butyl methyl ether. 4,181,809, Cl. 568-671.000.
Dahlberg, Bengt I., to Alfa-Laval AB. Starch production. 4,181,535, Cl. 127-68.000.
Dahlgren, Stig A., to Carbos, AG. Process for the preparation of furfural. 4,181,667, Cl. 260-347.900.
Dahms, Wolfgang, to Schering Aktiengesellschaft. Galvanic acid copper bath and method. 4,181,582, Cl. 204-52.00R.
Daicel Ltd.: *See*—
Arisaka, Katsuharu; Kobayashi, Seiichi; and Higashio, Kiyoshi, 4,181,007, Cl. 73-37.800.
Daimler-Benz Aktiengesellschaft: *See*—
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.
Dalton, Brian L., to Crosfield Exectronics Limited. Preparation of printing surfaces. 4,181,077, Cl. 101-401.100.
Dana Corporation: *See*—
Flotow, Richard A.; and Stiel, Hans, 4,181,199, Cl. 188-72.900.
Danckert, Hermann, to Volkswagenwerk Aktiengesellschaft. Engine mounting. 4,181,192, Cl. 180-232.000.
Danepak Ltd.: *See*—
Duddridge, John M., 4,181,053, Cl. 83-80.000.
Daniel, Jacques. Chain drive means for a bicycle or the like. 4,181,034, Cl. 74-243.0NC.
Dannelly, Clarence C., to Eastman Kodak Company. Rumen-stable pellets. 4,181,708, Cl. 424-19.000.
Dannelly, Clarence C., to Eastman Kodak Company. Rumen-stable pellets. 4,181,709, Cl. 424-21.000.
Dannelly, Clarence C.; Ardell, Richard E.; and Paar, Gary E., to Eastman Kodak Company. Rumen-stable pellets. 4,181,710, Cl. 424-33.000.
Darby, Lacy B.; and Holley, Joseph A., to Exxon Production Research Company. Method and apparatus for recovery of subsea well equipment. 4,181,196, Cl. 166-361.000.
Darling Store Fixtures, a division of the Marmon Group, Inc.: *See*—
Acuff, David W., 4,181,230, Cl. 211-208.000.
Dassler, Adolf. Outsole for sport shoes. 4,180,923, Cl. 36-32.00R.
Dathe, Christian: *See*—
Schumann, Hiltraut; and Dathe, Christian, 4,181,673, Cl. 260-448.20T.
Davenport, Bobby E.: *See*—
Nix, Edwin L.; and Davenport, Bobby E., 4,181,349, Cl. 296-39.00R.
Davidson, William E., to General Electric Company. Self-clean steam iron. 4,180,928, Cl. 38-77.830.
Davis, James L.; and Easterwood, Michael J., to General Motors Corporation. Citizens band transmitter with overall envelope feedback from antenna coupling filter. 4,181,889, Cl. 325-124.000.
Davis, Lester M. Fishing lure. 4,180,936, Cl. 43-42.500.
Davis, Richard L., to General Motors Corporation. Vibration damper with three sets of springs in parallel. 4,181,208, Cl. 192-106.100.
Davis, William A., to AM International, Inc. Automatic recirculating duplicator. 4,181,078, Cl. 101-426.000.
Dawans, Francois: *See*—
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,181,618, Cl. 252-51.50A.
Dean Research Corporation: *See*—
Henke, John R., 4,181,341, Cl. 294-67.00R.
DeCamp, Douglas A., to Flexfab, Inc. Fire sleeving. 4,181,157, Cl. 138-126.000.
de Cooker, Mario G. R. T.; and Haemers, Anita G. W. G., to Stamicarbon, B.V. Process for preparing cyanuric acid. 4,181,801, Cl. 544-192.000.
DeFord, Donald D., to Phillips Petroleum Company. Quantitative chromatographic analysis without calibration. 4,181,006, Cl. 73-23.100.
Deguchi, Seiji: *See*—
Iwata, Hiroshi; Ohtani, Takeiji; Arakawa, Seiichi; and Deguchi, Seiji, 4,181,581, Cl. 260-42.480.
DeLamoreaux, Murray I.; and McGee, Paul D., to Motorola, Inc. Radio and tape player apparatus. 4,181,823, Cl. 179-100.110.
De Macedo, Pedro Buarque: *See*—
Macedo, Pedro B.; Mohr, Robert K.; and Gupta, Prabhat K., 4,181,403, Cl. 350-96.330.
Denki Onkyo Co., Ltd.: *See*—
Yoshikawa, Norio, 4,181,908, Cl. 335-210.000.
Depuydt, Andre: *See*—
Heiremans, Robert; and Depuydt, Andre, 4,181,239, Cl. 220-461.000.
DeSantis, John A.; and Gottlieb, Ellis J., to Motorola, Inc. Low profile socket for circuit board with gas vents for fixed position soldering. 4,181,385, Cl. 339-17.00C.
Deshpande, Narayan V.: *See*—
Blossey, Daniel F.; Deshpande, Narayan V.; and Faucz, Eugene C., 4,181,426, Cl. 355-16.000.
Dessert, Richard. Energy efficient passenger vehicle. 4,181,188, Cl. 180-2.00A.
Detroit, William J., to American Can Company. Ozonated lignosulfonates. 4,181,652, Cl. 260-124.00R.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Holle, Hans-Joachem; and Morlock, Gerhard, 4,181,642, Cl. 260-37.0EP.
Deutschlander, Gert; and Low, Martin, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for forming stacks of flat items. 4,181,213, Cl. 198-419.000.

Devalois, Serge: *See—*
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,181,522, Cl. 75-96.000.

De Vries, Robert C.; Bundy, Francis P.; and Wentorf, Robert H., Jr., to General Electric Company. Method for the work-hardening of diamonds and product thereof. 4,181,505, Cl. 51-307.000.

Deya, Eiki: *See—*
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.

Di Palma Irrigation S.A.: *See—*
Moisan, Jean-Claude, 4,181,257, Cl. 239-183.000.

Diamond Shamrock Corporation: *See—*
Babinsky, Andrew D., 4,181,592, Cl. 204-283.000.

Diamond Shamrock Technologies S.A.: *See—*
Spaziante, Placido M.; and Nidola, Antonio, 4,181,777, Cl. 429-50.000.

Diepeveen, John C. Joy stick switch. 4,181,827, Cl. 200-6.00A.

Dietrichs, Hans-Hermann; Sinner, Michael; Opderbeck, Fritz; and Brachthauser, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschrankter Haftung. Process for obtaining xylan and fibrin from vegetable raw material containing xylan. 4,181,796, Cl. 536-1.000.

di Fiore, Lucio: *See—*
Cairati, Luciano; and di Fiore, Lucio, 4,181,629, Cl. 252-458.000.

Dillarstone, Alan; and Straw, Alan, to Colgate-Palmolive Company. Cleaning compositions. 4,181,623, Cl. 252-143.000.

Dilley, Douglas M., to United States of America, Navy. Sweeping noise blanker. 4,181,892, Cl. 325-474.000.

DiMatteo, Paul, to Solid Photography Inc. Reflected three dimensional display. 4,180,930, Cl. 40-160.000.

Dimsdale, Michael J.: *See—*
Newton, Roger F.; Roberts, Stanley M.; Rainey, David K.; and Dimsdale, Michael J., 4,181,674, Cl. 260-448.80R.

Dingwall, Andrew G. F., to RCA Corporation. High speed resettable dynamic counter. 4,181,862, Cl. 307-225.00C.

Dion-Biro, Guy. Apparatus for adding emulsifier to a fluid. 4,181,469, Cl. 417-87.000.

Dobner, Donald J., to General Motors Corporation. Integration of regenerative braking and conventional braking. 4,181,366, Cl. 303-3.000.

Dr. Ing. h.c.F. Porsche AG, Firma: *See—*
Kroniger, Wilhelm, 4,181,322, Cl. 280-699.000.

Dodge, Donald M., to Pacific Electricord Company. Cord attachment plug. 4,181,394, Cl. 339-103.00R.

Doggett, Roger H.; and Buccigross, Henry L., to Lubrizol Corporation, The. Bonding method employing water-activatable adhesive compositions comprising a plasticizer and an N-sulfohydrocarbon-substituted acrylamide polymer. 4,181,557, Cl. 156-331.000.

Doi, Toru: *See—*
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.

Dola, Frank P.; and Rossler, Frederick W., Jr., to AMP Incorporated. Flat cable connector having wire deployment means. 4,181,384, Cl. 339-14.00R.

Doleans, Guy: *See—*
Georget, Jean-Pierre; and Doleans, Guy, 4,181,266, Cl. 241-264.000.

Dominy, Francis I.; Partridge, Leslie W.; and Peltola, Veikko K., to Burdick Corporation, The. Ultrasound wattmeter. 4,181,004, Cl. 73-1.0DV.

Donato, Anthony C., to Lightolier Incorporated. Tap member with axially adjustable contact for multi-conductor electrical track. 4,181,388, Cl. 339-21.00R.

Dorius, John O.: *See—*
Marks, Ronald A.; and Dorius, John O., 4,180,980, Cl. 60-398.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Kanegae, Naomichi; and Ikemoto, Ichiro, 4,181,005, Cl. 73-19.000.

Douglas, Fredrick. Slinger device. 4,181,312, Cl. 277-133.000.

Dow Chemical Company, The: *See—*
Pangborn, Robert J., 4,181,585, Cl. 204-98.000.
Vaughn, Walter L.; and Allen, James A., 4,181,566, Cl. 162-164.0EP.
Wagner, Eugene R.; and Renzi, Alfred A., 4,181,737, Cl. 424-319.000.

Dowty Seals Limited: *See—*
Hillier, Edward F. H. B.; and Walker, Robin A., 4,181,313, Cl. 277-166.000.

Draft Systems, Inc.: *See—*
Fallon, Merton R., 4,181,143, Cl. 137-322.000.

Draper, Earle S., Jr. Transportable-expandable mobile home structure. 4,180,949, Cl. 52-67.000.

Dreibus, Perry J.: *See—*
Cerf, Donald B.; and Dreibus, Perry J., 4,181,314, Cl. 277-205.000.

Dresser Industries, Inc.: *See—*
Blanton, James R., 4,181,186, Cl. 175-297.000.
Keller, Wilbur S.; and Vanderford, William D., 4,181,185, Cl. 175-229.000.
Shockley, Thomas D., 4,181,035, Cl. 74-250.00R.

Drlik, Romuald J.: *See—*
Honacker, Horst; and Drlik, Romuald J., 4,181,509, Cl. 55-106.000.

Drori, Mordeki. Method of making fluid-issuing openings through the walls of flexible plastic members, particularly dripper emitters. 4,181,051, Cl. 83-19.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal N-[2,2-dimethyl-2,3-dihydro-7-benzofuranyl-methyl-carbamate]N-[4-nonylphenyl-methyl-carbamate] sulfide. 4,181,734, Cl. 424-285.000.

Duddridge, John M., to Danepak Ltd. Food slicers. 4,181,053, Cl. 83-80.000.

Duffy, Eugene P. Box setting tool. 4,181,295, Cl. 269-3.000.

Duigon, Ferdinand C.: *See—*
Liu, Shing-Gong; and Duigon, Ferdinand C., 4,181,755, Cl. 430-314.000.

Dungs, Horst: *See—*
Weber, Heinrich; Dungs, Horst; and Beckmann, Franz, 4,181,502, Cl. 44-10.00C.

Dunham-Bush, Inc.: *See—*
Shaw, David N., 4,180,986, Cl. 62-192.000.
Shaw, David N., 4,181,474, Cl. 417-366.000.

Dunn, Robert E., to Westinghouse Electric Corp. Heat exchanger tube guide and extractor tool therefor. 4,180,902, Cl. 29-726.000.

Du Pont de Nemours, E. I., and Company: *See—*
Booth, Charles L., 4,181,579, Cl. 204-1.00R.
Bullock, Greg A., 4,181,741, Cl. 424-311.000.
Fechtner, Harold F.; and Owens, Bruce E., 4,181,418, Cl. 354-277.000.
Honsberg, Wolfgang, 4,181,648, Cl. 260-45.75N.
McFall, Andrew J., 4,181,247, Cl. 226-97.000.
Pilz, Otto, 4,181,531, Cl. 430-270.000.
Severin, Gerard E., 4,181,768, Cl. 428-252.000.
Vassiliou, Eustathios, 4,181,686, Cl. 525-474.000.
Work, Ray A., III; and Pankratz, Richard P., 4,181,528, Cl. 428-474.000.

Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, to Institut Francais du Petrole; and Rhone-Poulenc Industries. Grafted copolymers and their use as additives for lubricating oils. 4,181,618, Cl. 252-51.50A.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active compounds as inhibitors of H-2 histamine receptors. 4,181,730, Cl. 424-273.00R.

Dusseau, Cortland R.: *See—*
Warman, Robert E.; and Dusseau, Cortland R., 4,181,918, Cl. 358-237.000.

Dyott, Richard B.; and Stevenson, John L., to Post Office, The. Method of making dielectric optical waveguides. 4,181,515, Cl. 65-3.00A.

E. R. Squibb & Sons, Inc.: *See—*
Haugwitz, Rudiger D.; and Weisenborn, Frank L., 4,181,663, Cl. 260-326.250.

Easterwood, Michael J.: *See—*
Davis, James L.; and Easterwood, Michael J., 4,181,889, Cl. 325-124.000.

Eastman Kodak Company: *See—*
Blakey, Cathy L.; and Sutton, Richard C., 4,181,526, Cl. 430-67.000.
Clark, Gary T., 4,181,653, Cl. 260-207.000.
Dannelly, Clarence C., 4,181,708, Cl. 424-19.000.
Dannelly, Clarence C., 4,181,709, Cl. 424-21.000.
Dannelly, Clarence C.; Ardell, Richard E.; and Paar, Gary E., 4,181,710, Cl. 424-33.000.
Jackson, Winston J., Jr.; and Morris, John C., 4,181,792, Cl. 528-190.000.
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,181,640, Cl. 260-30.40R.
Musser, Harry R., 4,181,793, Cl. 528-327.000.

Eaton Corporation: *See—*
Cornell, Charles R., 4,180,979, Cl. 60-395.000.
Karlovits, Frank K., 4,181,244, Cl. 222-227.000.

Eckhold, Gerd-Jurgen; and Maass, Hans, to Walter Eckold Vorrichtungs u. Geratebau Sperrluttertal. Tools for bending sheet metal. 4,181,002, Cl. 72-387.000.

Ecodyne Corporation: *See—*
Stone, Robert D., 4,181,692, Cl. 261-111.000.
Swindt, Joseph K., 4,181,693, Cl. 261-111.000.

Economy Engine Company, The: *See—*
Beeghly, Bruce R.; and Lepley, Joseph, 4,181,883, Cl. 324-166.000.

Edmund, John R.: *See—*
Cameto, Leon R.; and Edmund, John R., 4,181,129, Cl. 128-205.260.

Edoardo Weber - Fabbrica Italiana Carburatori S.p.A.: *See—*
Bellicardi, Francesco, 4,181,108, Cl. 123-119.0EC.

Edwards, Alfred G.; and Harris, Glyn I., to Albright & Wilson Limited. Process for preparing aralkylene phenol resins prepared from phenols and aralkylene esters. 4,181,791, Cl. 528-179.000.

Edwards, Ralph W.: *See—*
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., 4,181,268, Cl. 242-54.00A.

Egberg, David C.: *See—*
Growe, Glen H.; Patterson, Michael P.; and Egberg, David C., 4,181,745, Cl. 426-250.000.

Eguchi, Kazuo: *See—*
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.

Eguchi, Seiji: *See—*
Suzuki, Seigo; and Eguchi, Seiji, 4,181,938, Cl. 364-200.000.

Ehmke, Edward L., to Motorola, Inc. Battery saver for a tone coded signalling system. 4,181,893, Cl. 325-492.000.

Eichstaedt, Wolfgang. Pane cover device, particularly for windshields and windows of motor vehicles. 4,181,350, Cl. 296-95.00C.

Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschraenkter Haftung. Liquid crystalline cyclohexylcyclohexanes. 4,181,625, Cl. 252-299.000.

Eimen, Shawn H.: *See*—
Swenson, Richard F.; Eimen, Shawn H.; Gryga, John J., Jr.; and Schommer, Gerard E., 4,181,357, Cl. 297-353.000.
Eisai Co., Ltd.: *See*—
Morita, Eiichi; and Kanai, Takeo, 4,181,803, Cl. 546-237.000.
Eisenhoffer, Joseph H.: *See*—
Oliver, George D.; Eisenhoffer, Joseph T.; and Eisenhoffer, Joseph H., 4,181,282, Cl. 248-448.000.
Eisenhoffer, Joseph T.: *See*—
Oliver, George D.; Eisenhoffer, Joseph T.; and Eisenhoffer, Joseph H., 4,181,282, Cl. 248-448.000.
Ekstedt, Edward E.: *See*—
Stenger, Richard E.; Ekstedt, Edward E.; and Seto, Stanford P., 4,180,974, Cl. 60-39.710.
El Paso Products Company: *See*—
Cywinski, Norbert F., 4,181,809, Cl. 568-671.000.
Elam, Richard C., to Gulf & Western Industries, Inc. Method for preventing the deposition of a coating on a substrate. 4,181,758, Cl. 427-253.000.
Elbaum, Bernard M.; and Harvey, Engel, to Textron, Inc. Spectacle frame selector and display device. 4,180,921, Cl. 35-59.000.
Electronic Arrays, Inc.: *See*—
McCoy, Michael R., 4,181,980, Cl. 365-45.000.
Electronic Data Systems Corporation: *See*—
Jackson, William A.; and Jones, Hubert C., Jr., 4,181,948, Cl. 364-478.000.
Electroprint, Inc.: *See*—
Pressman, Gerald L.; and Gardiner, Kenneth W., 4,181,423, Cl. 355-4.000.
Elfotec A.G.: *See*—
Forgo, Gabor; and Moser, Karl, 4,181,422, Cl. 355-3.0DD.
Eli Lilly and Company: *See*—
Fox, William C., 4,181,603, Cl. 209-682.000.
Elias, Jack; and Bozarth, Theodore B., to Honeywell Inc. D.C. monitoring circuit. 4,181,842, Cl. 307-66.000.
Elitex, Koncern Textilniho Strojirenstvi: *See*—
Bajek, Frantisek; and Nejedly, Josef, 4,181,084, Cl. 112-71.000.
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,181,083, Cl. 112-67.000.
El-Kareh, Badih; Gersbach, John E.; and Houghton, Russell J., to International Business Machines Corporation. Bipolar two device dynamic memory cell. 4,181,981, Cl. 365-181.000.
Ellenberger, Willi; Blum, Holger; Muller-Zitzke, Harald; and Mascher, Ludwig, Jr., to Ellenberger, Willi. Method for hydrolysis of casein using orthophosphorous acids or salts thereof and montmorillonite. 4,181,651, Cl. 260-119.000.
Ellis, Ernest W.: *See*—
Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., 4,181,660, Cl. 548-110.000.
Elrod, Stephen H.; and Nance, Weldon B., to Milchem Incorporated. Aqueous drilling fluid and lubricant composition. 4,181,617, Cl. 252-8.50C.
Elser, Wolfgang; Hartwig, Ernst; and Ruske, Manfred, to BASF Aktiengesellschaft. Anthraquinone dyes. 4,181,668, Cl. 260-377.000.
EMI Limited: *See*—
Bone, Phillip R., 4,181,856, Cl. 250-366.000.
Fairbairn, Ian A., 4,181,850, Cl. 250-445.00T.
Moore, John F., 4,181,858, Cl. 250-445.00T.
Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,181,730, Cl. 424-273.00R.
Englin, Boris: *See*—
McOnie, Malcolm P.; Roberts, Philip D.; Rose, John B.; and Englin, Boris, 4,181,787, Cl. 526-62.000.
Ensign, Harold W., to Cla-Val Co. Diaphragm valve. 4,181,151, Cl. 137-625.280.
Enstrom, Robert V.: *See*—
Rayburn, Charles C.; and Enstrom, Robert V., 4,181,552, Cl. 156-204.000.
Entreprise d'Equipments Mecaniques et Hydrauliques E.M.H.: *See*—
Pagezy, Michel J.; and Loire, Rene, 4,181,452, Cl. 405-203.000.
Envirotech Corporation: *See*—
Honacker, Horst; and Drlik, Romuald J., 4,181,509, Cl. 55-106.000.
Epple, Peter C., to General Motors Corporation. Electric switch for motor reversing. 4,181,825, Cl. 200-1.00V.
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Rolling bearing having end rings mounted to engage a housing. 4,181,374, Cl. 308-6.00C.
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, to SKF Kugellagerfabriken GmbH. Roller bearing with rolling elements having concave center parts and convex end parts. 4,181,375, Cl. 308-6.00C.
Ernst Leitz Wetzlar GmbH: *See*—
Holle, Werner; and Bruckner, Dietrich, 4,181,412, Cl. 354-23.00R.
Schlapp, Werner; and Wiessner, Willi, 4,181,419, Cl. 354-286.000.
Wasmund, Heiko; and Klein, Walter, 4,181,436, Cl. 356-225.000.
Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See*—
Sick, Erwin, 4,181,398, Cl. 350-96.100.
Eschweiler Bergwerksverein: *See*—
Weber, Heinrich; Dungs, Horst; and Beckmann, Franz, 4,181,502, Cl. 44-10.00C.
Esposito, Felix F.; and Sepso, Roger P., to Robertshaw Controls Company. Electrical switch construction having armature latch. 4,181,907, Cl. 335-170.000.
Esquire, Inc.: *See*—
Nuver, Eric L. H., 4,181,873, Cl. 315-291.000.
Ethyl Corporation: *See*—
Bitting, James L.; and Tubb, Thomas L., Jr., 4,181,047, Cl. 81-9.510.
Etzold, Karl-Friedrich, to RCA Corporation. Matching network for switchable segmented ultrasonic transducers. 4,181,864, Cl. 310-314.000.
Euteco S.p.A.: *See*—
Cairati, Luciano; and di Fiore, Lucio, 4,181,629, Cl. 252-458.000.
Evenson, Raymond M., to Applied Power Inc. Single piece self-supporting shoe for use in a conduit bender. 4,180,997, Cl. 72-217.000.
Evers, Robert C.; and Moore, George J., to United States of America, Air Force. 2-Amino-4-ethynylphenol. 4,181,681, Cl. 260-575.000.
Exxon Production Research Company: *See*—
Darby, Lacy B.; and Holley, Joseph A., 4,181,196, Cl. 166-361.000.
Scherbatskoy, Serge A., 4,181,184, Cl. 175-65.000.
Exxon Research & Engineering Co.: *See*—
Brenner, Douglas; and Lundberg, Robert D., 4,181,780, Cl. 521-93.000.
Eylon, Daniel: *See*—
Fujishiro, Shiro; and Eylon, Daniel, 4,181,590, Cl. 204-192.00N.
Fa Wilh. Jul. Teufel: *See*—
Radulovic, Radoje; Karisik, Mustafa; and Wolfer, Klaus R., 4,180,870, Cl. 3-1.200.
Fahrbach, Erich: *See*—
Schuhmacher, Gunter; Fottinger, Walter; Graber, Adolf; and Fahrbach, Erich, 4,181,770, Cl. 428-260.000.
Fairbairn, Ian A., to EMI Limited. Data transmission in radiographic apparatus. 4,181,850, Cl. 250-445.00T.
Falconer, David D., to Bell Telephone Laboratories, Incorporated. Feedback nonlinear equalization of modulated data signals. 4,181,888, Cl. 325-42.000.
Fallon, Merton R., to Draft Systems, Inc. Valve assembly and coupler therefor. 4,181,143, Cl. 137-322.000.
Faucz, Eugene C.: *See*—
Blossey, Daniel F.; Deshpande, Narayan V.; and Faucz, Eugene C., 4,181,426, Cl. 355-16.000.
Faultless-Doerner Manufacturing Inc.: *See*—
Bowman, Vincent G., 4,181,280, Cl. 248-405.000.
Fechtner, Harold F.; and Owens, Bruce E., to Du Pont de Nemours, E. I., and Company. Film sheet cassette. 4,181,418, Cl. 354-277.000.
Feeser, Walter E.; and Gerhold, Mark L. C., to Burroughs Corporation. Data processor with improved microprogramming. 4,181,935, Cl. 364-200.000.
Fehlmann, Hans-Beat, to Loewe Anstalt. Composite panel materials and method of manufacture. 4,181,556, Cl. 156-292.000.
Feichtiger, Dieter: *See*—
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.
Feighan, Sean F. Basket construction. 4,181,234, Cl. 217-122.000.
Feldstein, Nathan, to Feldstein, Nathan. Process for metal deposition of a non-conductor substrate. 4,181,759, Cl. 427-304.000.
Feldstein, Nathan, to Surface Technology, Inc. Method for rendering non-platable surfaces platable. 4,181,760, Cl. 427-305.000.
Fenyes, Joseph G. E.; and Pera, John D., to Buckman Laboratories, Inc. Aminoalkylenephosphonic acids and salts thereof and their use in aqueous systems. 4,181,806, Cl. 549-6.000.
Fergason, James L. Process for increasing display brightness of liquid crystal displays by bleaching polarizers using screen-printing techniques. 4,181,756, Cl. 427-163.000.
Ferranti Limited: *See*—
Parker, John C., 4,181,863, Cl. 307-311.000.
Fiat Societa per Azioni: *See*—
Fusi, Angelo, 4,181,334, Cl. 292-87.000.
Vannini, Paolo; Rivetti, Enrico; and Bertone, Antonino, 4,181,373, Cl. 303-116.000.
Filippov, Vasily V.: *See*—
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Firestone, Raymond A.: *See*—
Christensen, Burton G.; and Firestone, Raymond A., 4,181,733, Cl. 424-274.000.
Fischer, Albert G., to Brown, Boveri & Cie. Process for the production of electroluminescent powders for display panels and coating the powders with zinc phosphate. 4,181,753, Cl. 427-64.000.
Fischer, Ernst A., to Hoffmann-La Roche Inc. Process for producing immunological diagnostic reagents. 4,181,636, Cl. 260-8.000.
Fischer & Porter Co.: *See*—
Herzl, Peter J., 4,181,020, Cl. 73-194.0VS.
Schmoock, Roy F., 4,181,018, Cl. 73-194.0EM.
Fischer, Wilhelm: *See*—
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,181,637, Cl. 260-16.000.
Fives-Cail Babcock: *See*—
Georget, Jean-Pierre; and Doleans, Guy, 4,181,266, Cl. 241-264.000.
Fixel, Irving E. Implanted acetabular prosthesis. 4,180,873, Cl. 3-1.912.
Fleischer, Henry. Folding baby carriers. 4,181,356, Cl. 297-350.000.
Fleming, Ray Frost: *See*—
Kidd, Robert L., 4,181,158, Cl. 139-33.000.
Flexfab, Inc.: *See*—
DeCamp, Douglas A., 4,181,157, Cl. 138-126.000.

Flory, Donald M., to General Motors Corporation. Hydraulic brake booster. 4,181,064, Cl. 91-6.000.
Flotow, Richard A.; and Stiel, Hans, to Dana Corporation. Caliper type disc brake. 4,181,199, Cl. 188-72.900.
Flower, Robert A., to Singer Company, The. Velocity measuring system. 4,181,432, Cl. 356-28.000.
FMC Corporation: *See—*
Hirahara, Katsuji, 4,181,072, Cl. 99-353.000.
Lill, Melvin H.; and Wiederrich, James L., 4,180,915, Cl. 33-228.000.
McCarthy, Richard H., 4,181,201, Cl. 188-171.000.
Watson, Clyde D., 4,181,702, Cl. 422-265.000.
Fogarty, Thomas N.; Harshbarger, William R.; and Porter, Roy A., to Bell Telephone Laboratories, Incorporated. Fabrication of patterned silicon nitride insulating layers having gently sloping sidewalls. 4,181,564, Cl. 156-643.000.
Foley, James W.: *See—*
Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., 4,181,660, Cl. 548-110.000.
Foley, Norman L., to Auscoteng Pty. Ltd. Refrigeration type water desalinisation units. 4,181,577, Cl. 202-181.000.
Fontana, Pietro: *See—*
Stefani, Giancarlo; and Fontana, Pietro, 4,181,628, Cl. 252-435.000.
Fontanille, Michel: *See—*
Sigwalt, Pierre; Guyot, Patrick; Fontanille, Michel; and Vairon, Jean-Pierre, 4,181,684, Cl. 585-25.000.
Ford Motor Company: *See—*
Chattha, Mohinder S., 4,181,783, Cl. 525-161.000.
Chattha, Mohinder S.; Beckwith, Elaine C. S.; and van Oene, Henk, 4,181,784, Cl. 525-161.000.
Chattha, Mohinder S.; Siwiec Beckwith, Elaine C.; and van Oene, Henk, 4,181,785, Cl. 525-161.000.
Forgo, Gabor; and Moser, Karl, to Elfotec A.G. Process and apparatus for developing and cleaning a charge image carrier. 4,181,422, Cl. 355-3.0DD.
Forster, Richard G.; and Howard, John K., to International Business Machines Corporation. Program branching method and apparatus. 4,181,942, Cl. 364-200.000.
Forster, Siegfried; Hewing, Gunther; and Kleeman, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Vehicular gas turbine installation with ceramic recuperative heat exchanger elements arranged in rings around compressor, gas turbine and combustion chamber. 4,180,973, Cl. 60-39.51R.
Forte, Jimmy L.; and Lindsay, Creo B. Bi-directional filter-drier for heat pumps. 4,180,988, Cl. 62-474.000.
Foster, Edwin E. Spring powered swing. 4,181,299, Cl. 272-86.000.
Foster Wheeler Energy Corporation: *See—*
Stevens, William D., 4,181,263, Cl. 241-19.000.
Foster, Wilbert J., to Blair, Annan. Dome structure. 4,180,950, Cl. 52-81.000.
Fottinger, Walter: *See—*
Schuhmacher, Gunter; Fottinger, Walter; Graber, Adolf; and Fahrbach, Erich, 4,181,770, Cl. 428-260.000.
Fox, Elinor; Rubinstein, William; and Hamilton, William. Electronic backgammon game. 4,181,308, Cl. 273-237.000.
Fox, William C., to Eli Lilly and Company. Capsule sorting apparatus. 4,181,603, Cl. 209-682.000.
Frahm, Carl E. Device for filtering beverages. 4,181,243, Cl. 222-189.000.
Fram Corporation: *See—*
Thornton, Donald I.; and Peyton, Richard H., 4,180,885, Cl. 15-250.320.
Francioni, Willi, to Gesellschaft zur Forderung der Forschung an der Eidg. Hochschule Techn. Masonry wall, method for its production, and its use. 4,180,951, Cl. 52-100.000.
Francis, Woodie R.: *See—*
Veronesi, Luciano; and Francis, Woodie R., 4,181,471, Cl. 417-360.000.
Franken, Adrianus J. J.: *See—*
Wesselink, Gustaaf A.; Franken, Adrianus J. J.; and Smulders, Hendricus F. G., 4,181,155, Cl. 138-30.000.
Franz Vertriebsgesellschaft mbH: *See—*
Blesser, Barry A.; and Bader, Karl-Otto, 4,181,820, Cl. 179-1.00J.
Frazier, Gregory D., to Texaco Inc. Oil recovery prediction technique. 4,181,176, Cl. 166-252.000.
Frey, Richard C.; Railey, Malcolm R.; and Wargo, Thomas J., to University of Akron, The. Apparatus for presenting a sequence of fixed pictures. 4,181,971, Cl. 364-900.000.
Fritz Steller GmbH & Co. KG: *See—*
Huls, Fritz; and Hentze, Paul W., 4,181,217, Cl. 198-842.000.
Frohlich, Alfons; and Ranalli, Horst, to OPTI Patent-, Forschungs- und Fabrikations-AG. Method of and apparatus for making a slide-fastener stringer. 4,181,159, Cl. 139-116.000.
Frost, Barry L., to Clark Equipment Company. Dual path, dual range transmission. 4,181,041, Cl. 74-687.000.
Fuji Electric Co., Ltd.: *See—*
Fujiwara, Masakatsu, 4,181,932, Cl. 363-68.000.
Fuji Heavy Industries Co., Ltd.: *See—*
Takano, Toshio, 4,181,138, Cl. 137-54.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kogure, Yasuyuki; and Okada, Yoneo, 4,181,276, Cl. 244-215.000.
Fuji Photo Film Co., Ltd.: *See—*
Ikenoue, Shinpei; Sekikawa, Nobuyoshi; and Masuda, Takao, 4,181,530, Cl. 430-620.000.
Satomura, Masato; Kiritani, Masataka; and Nishimura, Taiichi, 4,181,328, Cl. 282-27.500.
Toda, Yuzo; Mukunoki, Yasuo; and Koizumi, Junji, 4,181,527, Cl. 430-543.000.
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Sealed type hydraulic reservoir. 4,181,147, Cl. 137-572.000.
Fujimori, Yoshiaki: *See—*
Tokunaga, Ikuo; Uchiyama, Hideaki; and Fujimori, Yoshiaki, 4,180,970, Cl. 58-57.500.
Fujimoto, Noriki: *See—*
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.
Fujishiro, Shiro; and Eylon, Daniel, to United States of America, Air Force. Method of ion plating titanium and titanium alloys with noble metals and their alloys. 4,181,590, Cl. 204-192.00N.
Fujitsu Fanuc Limited: *See—*
Kohzai, Yoshinori; Kawada, Shigeki; and Oyama, Shigeaki, 4,181,875, Cl. 318-252.000.
Fujitsu Limited: *See—*
Hattori, Akira; and Tsuchimoto, Takamitsu, 4,181,937, Cl. 364-200.000.
Fujiwara, Masakatsu, to Fuji Electric Co., Ltd. Power converter. 4,181,932, Cl. 363-68.000.
Fukaya, Hiroyasu: *See—*
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,181,884, Cl. 324-208.000.
Fukuda, Takashi; Shimada, Masayoshi; Ishizaki, Nobuo; and Iwahori, Shoichi, to Toyobo Co., Ltd. Carbon adsorptive filter material with layers of reinforcing non woven fabrics needle punched. 4,181,513, Cl. 55-316.000.
Funk, Charles F., to Met-L-Parts, Inc. Self releasing sling hoist. 4,181,342, Cl. 294-75.000.
Furukawa, Hiroshi: *See—*
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Fusi, Angelo, to Fiat Societa per Azioni. Safety catch. 4,181,334, Cl. 292-87.000.
G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Becker, Wolfgang, 4,181,251, Cl. 235-451.000.
G. D. Searle & Co.: *See—*
Liang, Chi-Dean, 4,181,670, Cl. 260-410.500.
Noller, Hans G., 4,181,441, Cl. 356-414.000.
G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,181,561, Cl. 156-566.000.
Gagnon, Peter R.: *See—*
Warren, Bernard J.; and Gagnon, Peter R., 4,181,869, Cl. 313-315.000.
Galafassi, Pierre: *See—*
Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, 4,181,499, Cl. 8-26.000.
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of retarding the cooling of molten metal. 4,181,522, Cl. 75-96.000.
Galleithner, Hans: *See—*
Pech, Gunther; and Galleithner, Hans, 4,181,483, Cl. 425-36.000.
Gallo, Luigi C., to Ampex Corporation. High bit rate digital data signal transmission system. 4,181,817, Cl. 178-68.000.
Gam, Erik A.: *See—*
Topsoe, Haldor F. A.; and Gam, Erik A., 4,181,701, Cl. 422-158.000.
Ganellin, Charon R.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,181,730, Cl. 424-273.00R.
Gange, Robert A., to RCA Corporation. Proximity focused electron beam guide display device including mesh having apertures no greater than 26 microns in one dimension. 4,181,871, Cl. 313-422.000.
Ganser, Friedrich: *See—*
Laar, Erwin; Ganser, Friedrich; and Hammer, Thomas, 4,181,270, Cl. 242-66.000.
Garcia, John A. M. Candle holder. 4,181,927, Cl. 362-163.000.
Gardiner, Kenneth W., to Savin Corporation. Excess developer removal apparatus. 4,181,094, Cl. 118-652.000.
Gardiner, Kenneth W.: *See—*
Pressman, Gerald L.; and Gardiner, Kenneth W., 4,181,423, Cl. 355-4.000.
Garman, Dean H.: *See—*
Schmidt, Dieter H.; and Garman, Dean H., 4,180,947, Cl. 51-326.000.
Garrett, Scott T.; Kulle, Lee K.; and Rudzena, William L., to Baxter Travenol Laboratories, Inc. Casette for use with an I.V. infusion controller. 4,181,245, Cl. 222-450.000.
Gateau, Patrick: *See—*
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,181,618, Cl. 252-51.50A.
Gattus, Yves, to S.A. Martin. Ink return circuit for a flexographic printing machine. 4,181,076, Cl. 101-350.000.

Gavin, David C. Cleaning composition and method for removing marine accumulations from surfaces. 4,181,622, Cl. 252-143.000.
Gazda, Imre I., to Otis Engineering Corporation. Running tool. 4,181,344, Cl. 294-86.180.
Gebr. Isringhausen: *See*—
Grass, Gerd; and Hettich, Jorg, 4,181,353, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, 4,181,354, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, 4,181,355, Cl. 297-307.000.
Geisen, Karl: *See*—
Hitzel, Volker; Weyer, Rudi; Geisen, Karl; and Pfaff, Werner, 4,181,658, Cl. 424-266.000.
Gell, Harold A., Jr. Radiation controlling reversible window. 4,180,954, Cl. 52-171.000.
Gemp, Robert S., to Westinghouse Electric Corp. Inertia compensated static motor drive. 4,181,877, Cl. 318-345.00R.
General Electric Company: *See*—
Boldebuck, Edith M.; and Banucci, Eugene G., 4,181,641, Cl. 260-33.20R.
Davidson, William E., 4,180,928, Cl. 38-77.830.
De Vries, Robert C.; Bundy, Francis P.; and Wentorf, Robert H., Jr., 4,181,505, Cl. 51-307.000.
Keese, Charles R.; Giaever, Ivar; and Ward, William J., III, 4,181,501, Cl. 23-230.00B.
Kiesel, George W.; and Willard, Henry G., 4,181,389, Cl. 339-32.00M.
Liu, Yung S., 4,181,899, Cl. 331-94.50C.
Nash, Dudley O., 4,181,260, Cl. 239-265.390.
Olashaw, William F., 4,181,396, Cl. 339-263.00R.
Rickert, Milton E., Jr., 4,181,773, Cl. 428-329.000.
Stenger, Richard E.; Ekstedt, Edward E.; and Seto, Stanford P., 4,180,974, Cl. 60-39.710.
General Foods Limited: *See*—
Newman, Alec T.; and Rhodes, David, 4,181,162, Cl. 141-105.000.
General Motors Corporation: *See*—
Barnett, Ronald R., 4,181,325, Cl. 280-739.000.
Beardmore, John M., 4,180,977, Cl. 60-342.000.
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., 4,181,268, Cl. 242-54.00A.
Cataldo, Roy S., 4,181,031, Cl. 74-234.000.
Cumming, Richard J.; and Stephenson, Warren R., 4,181,833, Cl. 200-61.620.
Davis, James L.; and Easterwood, Michael J., 4,181,889, Cl. 325-124.000.
Davis, Richard L., 4,181,208, Cl. 192-106.100.
Dobner, Donald J., 4,181,366, Cl. 303-3.000.
Epple, Peter C., 4,181,825, Cl. 200-1.00V.
Flory, Donald M., 4,181,064, Cl. 91-6.000.
Herman, Avrum S.; and Reider, Samuel B., 4,180,972, Cl. 60-39.320.
Hewko, Lubomyr O., 4,181,030, Cl. 74-12.000.
Janke, Fritz, 4,181,036, Cl. 74-477.000.
Knape, Richard S.; and Moreau, Richard A., 4,181,010, Cl. 73-119.00A.
Longhouse, Richard E., 4,181,172, Cl. 165-51.000.
Maddock, Don G., 4,180,978, Cl. 60-345.000.
Malloy, John D., 4,181,203, Cl. 192-3.300.
Mennucci, Donald F.; and Auman, John T., 4,181,205, Cl. 192-58.00B.
Mitchell, Clarence I., 4,181,145, Cl. 137-493.800.
Rantala, Charles W., 4,180,957, Cl. 52-718.000.
Wheaton, Robert F., 4,181,209, Cl. 192-111.00A.
General Signal Corporation: *See*—
Schwab, Carl E.; and Rost, David P., 4,181,956, Cl. 364-521.000.
Sibley, Henry C., 4,181,849, Cl. 235-92.00T.
GenRad, Inc.: *See*—
Hall, Henry P., 4,181,949, Cl. 364-487.000.
Gentex Corporation: *See*—
Shenier, Richard S., 4,181,818, Cl. 179-1.00P.
George, John A. Siphon apparatus. 4,181,142, Cl. 137-124.000.
George Koch Sons, Inc.: *See*—
Tredwell, Gilman, 4,181,093, Cl. 118-323.000.
Georget, Jean-Pierre; and Doleans, Guy, to Fives-Cail Babcock. Pneumatically assisted maintaining and setting systems for the jaw-plate of a jaw crusher. 4,181,266, Cl. 241-264.000.
Georgi, Bernd: *See*—
Niemann, Ernst-Georg; and Georgi, Bernd, 4,181,442, Cl. 356-417.000.
Gerhardt, Heinz A., to Northrop Corporation. Variable span wing. 4,181,277, Cl. 244-218.000.
Gerhold, Mark L. C.: *See*—
Feeser, Walter E.; and Gerhold, Mark L. C., 4,181,935, Cl. 364-200.000.
Gersbach, John E.: *See*—
El-Kareh, Badih; Gersbach, John E.; and Houghton, Russell J., 4,181,981, Cl. 365-181.000.
Gesellschaft fur Kernforschung m.b.H.: *See*—
Schmid, Jurgen; Schutte, Rolf; and Steinhaus, Harald, 4,181,508, Cl. 55-82.000.
Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen: *See*—
Niemann, Ernst-Georg; and Georgi, Bernd, 4,181,442, Cl. 356-417.000.
Gesellschaft zur Forderung der Forschung an der Eidg. Hochschule Techn.: *See*—
Francioni, Willi, 4,180,951, Cl. 52-100.000.
Getrag Getriebe- und Zahnradfabrik GmbH: *See*—
Hofmann, Hans, 4,181,040, Cl. 74-677.000.
Ghibaudi, Ana M.: *See*—
Trajtenberg, Aaron; and Ghibaudi, Ana M., 4,181,202, Cl. 188-252.000.
Giaever, Ivar: *See*—
Keese, Charles R.; Giaever, Ivar; and Ward, William J., III, 4,181,501, Cl. 23-230.00B.
Giallorenzi, Thomas G.: *See*—
Weller, Joseph F.; Crowley, James D.; and Giallorenzi, Thomas G., 4,181,904, Cl. 333-153.000.
Gielsok, Hans-Peter: *See*—
Ketteler, Otto; and Gielsok, Hans-Peter, 4,181,269, Cl. 242-65.000.
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Polyparabanic acid derivatives and process therefor. 4,181,789, Cl. 528-73.000.
Gilbert, Ghislain: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,181,522, Cl. 75-96.000.
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., to Mobil Oil Corporation. Manufacture of lube base stock oil. 4,181,598, Cl. 208-58.000.
Gillett, Bruce F. Gas-operated liquid pump. 4,181,470, Cl. 417-131.000.
Ginos, James Z.; and Cotzias, George C., to Cornell Research Foundation, Inc. Catecholamine derivatives, a process for their preparation and pharmaceutical compositions thereof. 4,181,738, Cl. 424-330.000.
Girling Limited: *See*—
Mortimer, Ivan, 4,181,372, Cl. 303-115.000.
Givaudan Corporation: *See*—
Huber, Ulrich; and Wild, Hans J., 4,181,666, Cl. 260-347.800.
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,181,631, Cl. 252-522.000.
Glaxo Group Limited: *See*—
Croci, Marco; and Cotti, Gino, 4,181,656, Cl. 260-239.100.
Godsey, Ernest E. Interrupt system and method. 4,181,941, Cl. 364-200.000.
Goglio, Luigi. Two-way valve closing at balanced pressure condition. 4,181,146, Cl. 137-493.900.
Goldman, Patricia J.: *See*—
Beckenbaugh, William M.; Goldman, Patricia J.; and Morton, Kim L., 4,181,750, Cl. 430-414.000.
Goodyear Canada, Inc.: *See*—
Gordon, Robert E., 4,181,168, Cl. 152-362.0CS.
Gordon, Robert E., to Goodyear Canada, Inc. Pneumatic tire. 4,181,168, Cl. 152-362.0CS.
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, to Gutehoffnungshutte Sterkrade A.G. Mining method and mining machine for cutting away hard mineral materials. 4,181,363, Cl. 299-17.000.
Gosser, Robert B.; and Zomp, John M., to Westinghouse Electric Corp. Electrical cell charge energy measuring method and apparatus. 4,181,885, Cl. 324-428.000.
Goth, Stephen: *See*—
Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,181,769, Cl. 428-253.000.
Gottlieb, Ellis J.: *See*—
DeSantis, John A.; and Gottlieb, Ellis J., 4,181,385, Cl. 339-17.00C.
Goudey, Clifford A., to Massachusetts Institute of Technology. Hydrofoil trawl door. 4,180,935, Cl. 43-9.000.
Gould, Inc.: *See*—
Maldavs, Ojars, 4,181,150, Cl. 137-614.060.
Gouveia, Philip H., to Becton, Dickinson and Company. One-way valve stopper. 4,181,233, Cl. 215-247.000.
Graber, Adolf: *See*—
Schuhmacher, Gunter; Fottinger, Walter; Graber, Adolf; and Fahrbach, Erich, 4,181,770, Cl. 428-260.000.
Grabowski, Walter. Connector for electrical components to be installed in flush receptacle boxes. 4,181,395, Cl. 339-176.0MF.
Grass, Gerd; and Hettich, Jorg, to Gebr. Isringhausen. Vehicle seat. 4,181,353, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, to Gebr. Isringhausen. Vehicle seat. 4,181,354, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, to Gebr. Isringhausen. Vehicle seat. 4,181,355, Cl. 297-307.000.
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, to Robert Bosch GmbH. High-voltage ignition system to generate a spark for an internal combustion engine, and method to generate the spark energy. 4,181,112, Cl. 123-148.00E.
Grawey, Charles E.; Untz, Robert W.; and Koch, Keith E., to Caterpillar Tractor Co. Rim constructions. 4,181,169, Cl. 152-404.000.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., to Caterpillar Tractor Co. Tire tread forming apparatus. 4,181,482, Cl. 425-28.00R.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., to Caterpillar Tractor Co. Tire tread forming mold body. 4,181,488, Cl. 425-577.000.
Gray, Gerald A., Jr.: *See*—
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.
Gray, Kenneth R. Products for correcting iron chlorosis in plants. 4,181,516, Cl. 71-25.000.
Green, George E., to Ciba-Geigy Corporation. Polymerizable esters derived from a glycidyl ether of a phenolic unsaturated ketone. 4,181,807, Cl. 560-52.000.
Greer Hydraulics, Inc.: *See*—
Zahid, Abduz, 4,181,156, Cl. 138-30.000.

Greive, Aloys; and Horstmann, Aloys, to Hamel GmbH - Zwirnmaschinen. Cable-twisting two yarns. 4,180,967, Cl. 57-66.000.
Grenier, Maurice, to L'air Liquide, Societe Anonyme pour l'etude et l'Exploitation des Procedes Georges Claude. Heat exchangers. 4,181,174, Cl. 165-180.000.
Grenier, Raymond P.: *See—*
Hatton, John; and Grenier, Raymond P., 4,181,839, Cl. 250-505.000.
Griffin, Andrew J.: *See—*
Andresen, Richard P.; Armington, Robert M.; Cannon, Robert L., III; and Griffin, Andrew J., 4,181,135, Cl. 128-703.000.
Grigoraschenko, Vladimir A.: *See—*
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Groezinger, John J.: *See—*
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,482, Cl. 425-28.00R.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,488, Cl. 425-577.000.
Gropper, Lee: *See—*
Chervenka, Charles H.; and Gropper, Lee, 4,181,700, Cl. 422-102.000.
Gross, Fernand. Wall tie and a wall incorporating the wall tie. 4,180,956, Cl. 52-407.000.
Grossniklaus, Hans. Solid fuel furnace. 4,181,082, Cl. 110-297.000.
Grosu, Stefan I., to Institutul de Cercetari Pentru Industria Electrotehnica - ICPE. Alternating current motor. 4,181,868, Cl. 310-166.000.
Growe, Glen H.; Patterson, Michael P.; and Egberg, David C. Method for decorating the shells of eggs. 4,181,745, Cl. 426-250.000.
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, to Boehringer Mannheim GmbH. Composition and method for the determination of cholesterol. 4,181,575, Cl. 435-11.000.
Grubman, Moe M. Pet and baby toilet seat. 4,181,096, Cl. 119-1.000.
Gruter, Johann, to Luwa AG. Method for condensation of vapors formed in a thermal separator. 4,181,608, Cl. 210-71.000.
Gryga, John J., Jr.: *See—*
Swenson, Richard F.; Eimen, Shawn H.; Gryga, John J., Jr.; and Schommer, Gerard E., 4,181,357, Cl. 297-353.000.
GTE Laboratories Incorporated: *See—*
McKinzie, Howard; and Trickett, Elizabeth A., 4,181,593, Cl. 204-290.00F.
McKinzie, Howard; and Trickett, Elizabeth A., 4,181,754, Cl. 427-74.000.
GTE Sylvania Incorporated: *See—*
Tajnai, Joseph D.; Chadwick, Curt H.; and Radecki, Dan J., 4,181,900, Cl. 331-94.50P.
Warren, Bernard J.; and Gagnon, Peter R., 4,181,869, Cl. 313-315.000.
Gulf Oil Corporation: *See—*
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,181,794, Cl. 528-496.000.
Gulf & Western Industries, Inc.: *See—*
Elam, Richard C., 4,181,758, Cl. 427-253.000.
Gulf & Western Manufacturing Company: *See—*
Jensen, James W.; and Miller, Stanley J., 4,181,015, Cl. 73-159.000.
Gullikson, Sture G., to Aktiebolaget Hagglund & Soner. Apparatus for supporting and controlling the grabbing device of hoisting gear. 4,181,291, Cl. 254-184.000.
Gumerman, Raymond J., to Chevron Research Company. Purification of fluidized-bed combustion flue gas. 4,181,705, Cl. 423-235.000.
Gunther, Roland: *See—*
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, 4,181,363, Cl. 299-17.000.
Gupta, Prabhat K.: *See—*
Macedo, Pedro B.; Mohr, Robert K.; and Gupta, Prabhat K., 4,181,403, Cl. 350-96.330.
Gurkov, Konstantin S.: *See—*
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Gustafsson, Leif B.: *See—*
Carlsson, Hans T. H.; and Gustafsson, Leif B., 4,181,114, Cl. 123-148.0CC.
Gustafsson, Sven H., to Atlas Copco AB. Wagon having incorporated support jacks. 4,181,182, Cl. 173-23.000.
Gutehoffnungshutte Sterkrade A.G.: *See—*
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, 4,181,363, Cl. 299-17.000.
Guyot, Patrick: *See—*
Sigwalt, Pierre; Guyot, Patrick; Fontanille, Michel; and Vairon, Jean-Pierre, 4,181,684, Cl. 585-25.000.
Haase, Georg: *See—*
Wudel, Egon; and Haase, Georg, 4,180,887, Cl. 15-415.00R.
Haber, Terry M. Illuminated dice and storage housing. 4,181,304, Cl. 273-146.000.
Habermann, Helmut: *See—*
Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice, 4,180,946, Cl. 51-134.50R.
Haemers, Anita G. W. G.: *See—*
de Cooker, Mario G. R. T.; and Haemers, Anita G. W. G., 4,181,801, Cl. 544-192.000.
Hagemark, Kjell I.: *See—*
Weiher, Richard L.; Voll, Gerhard W.; and Hagemark, Kjell I., 4,181,627, Cl. 252-301.60R.
Hahn-Godeffroy, Johann-Diederich: *See—*
Speck, Ulrich; Pinter, Erwig; Lachnit-Fixson, Ursula; and Hahn-Godeffroy, Johann-Diederich, 4,181,721, Cl. 424-243.000.
Haldor Topsoe A/S: *See—*
Topsoe, Haldor F. A.; and Gam, Erik A., 4,181,701, Cl. 422-158.000.
Hall, Charles M.; and Johnson, Herbert G., to Upjohn Company, The. Quinoxalinone compounds useful for expanding the lumina or air passages in mammals. 4,181,724, Cl. 424-250.000.
Hall, Henry P., to GenRad, Inc. Method of and apparatus for phase-sensitive detection. 4,181,949, Cl. 364-487.000.
Hall, Peter J., to MicroVue Products Inc. Microfiche reader projection screen. 4,181,404, Cl. 350-125.000.
Hall, Thomas C.; and Peters, John W., to Hughes Aircraft Company. Process for the preparation of low temperature silicon nitride films by photochemical vapor deposition. 4,181,751, Cl. 427-53.100.
Haller, Karl-Heinz; and Muller, Helmut, to Kienzle Apparate GmbH. Device for selecting a line to be printed in a printer. 4,181,445, Cl. 400-632.100.
Halliburton Company: *See—*
Knox, Lloyd C.; and Streich, Steven G., 4,181,454, Cl. 405-227.000.
Halloran, John J., Jr., to Combustion Engineering, Inc. Centrifugally or static cast grinding rolls. 4,181,264, Cl. 241-117.000.
Hamas, Robert S. Pre-centered total wrist prosthesis. 4,180,871, Cl. 3-1.910.
Hamberg, Mats A.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,181,725, Cl. 424-258.000.
Hamel GmbH - Zwirnmaschinen: *See—*
Greive, Aloys; and Horstmann, Aloys, 4,180,967, Cl. 57-66.000.
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., to Rockwell International Corporation. Method for superplastic forming. 4,181,000, Cl. 72-60.000.
Hamilton, William: *See—*
Fox, Elinor; Rubinstein, William; and Hamilton, William, 4,181,308, Cl. 273-237.000.
Hammarstrom, Sven R.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,181,725, Cl. 424-258.000.
Hammer, Thomas: *See—*
Laar, Erwin; Ganser, Friedrich; and Hammer, Thomas, 4,181,270, Cl. 242-66.000.
Hanifin, John W., Jr.; and Ridge, David N., to American Cyanamid Company. 2-Benzoyl-3-alkoxy-2-alkenonitriles. 4,181,677, Cl. 260-465.00F.
Hannebaum, Harold W. Fireplace. 4,181,117, Cl. 126-120.000.
Hannigan, Joseph, Jr. Apparatus for collapsing steam tubes for removal from a steam boiler. 4,180,903, Cl. 29-727.000.
Hansen, Bertil; and Holmberg, Krister, to Aktiebolaget Leo. Steroid esters preparation. 4,181,669, Cl. 260-397.400.
Hansen, Kai, to Leo Pharmaceutical Products Ltd. A/S. Bis-penicillanoyloxy-alkanes. 4,181,659, Cl. 424-271.000.
Hanson, Duane E.; and Bartels, Philip R., to NCR Corporation. Thermally responsive record material. 4,181,771, Cl. 428-327.000.
Harmony, Richard C. Insulator for canned drinks. 4,181,765, Cl. 428-157.000.
Harris, Glyn I.: *See—*
Edwards, Alfred G.; and Harris, Glyn I., 4,181,791, Cl. 528-179.000.
Harris, Lewis K.; and Pearse, Howard J., to Combustion Engineering, Inc. Position transmitter. 4,181,021, Cl. 73-317.000.
Harrison, Steadman D., Jr.: *See—*
Cowsar, Donald R.; and Harrison, Steadman D., Jr., 4,181,500, Cl. 23-230.00B.
Harshbarger, William R.: *See—*
Fogarty, Thomas N.; Harshbarger, William R.; and Porter, Roy A., 4,181,564, Cl. 156-643.000.
Hart, James R.: *See—*
Popper, Felix B.; McCarthy, Jeremiah B.; and Hart, James R., 4,181,672, Cl. 260-429.00J.
Harth, Helmut: *See—*
Raaf, Helmut; L'Orange, Raul; and Harth, Helmut, 4,181,621, Cl. 252-102.000.
Hartwig, Ernst: *See—*
Elser, Wolfgang; Hartwig, Ernst; and Ruske, Manfred, 4,181,668, Cl. 260-377.000.
Harvey, Engel: *See—*
Elbaum, Bernard M.; and Harvey, Engel, 4,180,921, Cl. 35-59.000.
Harvey, Louis A. Towel-rack-supported shelf cabinet. 4,181,382, Cl. 312-245.000.
Hashimoto Denki Co., Ltd.: *See—*
Miyata, Sinji, 4,181,055, Cl. 83-350.000.
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, to Kuraray Co., Ltd. Apparatus for conveying cops and bobbins for directly connecting ring frame with winder. 4,181,228, Cl. 209-552.000.
Hashimoto, Masashi: *See—*
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.

Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing hollow fibers of acrylonitrile polymers for ultrafilter. 4,181,694, Cl. 264-41.000.

Hasuo, Katsuhiko: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.

Hatton, John; and Grenier, Raymond P., to Cardiac Medical Sciences Corp. Multi-view collimator. 4,181,839, Cl. 250-505.000.

Hattori, Akira; and Tsuchimoto, Takamitsu, to Fujitsu Limited. Data processing system having an intermediate buffer memory. 4,181,937, Cl. 364-200.000.

Haug, Ernst: *See*—
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.

Haugwitz, Rudiger D.; and Weisenborn. Frank L., to E. R. Squibb & Sons, Inc. Selenium containing derivatives of proline and pipecolic acid. 4,181,663, Cl. 260-326.250.

Haver, Frank P.: *See*—
Wong, Morton M.; and Haver, Frank P., 4,181,588, Cl. 204-115.000.

Havera, Herbert J.; Vidrio, Horacio; and Johnson, Richard D., to Miles Laboratories, Inc. 2-Aminooctahydroindolo[2,3-a]quinolizines useful in treating cardiovascular disorders. 4,181,657, Cl. 424-256.000.

Hawkins, Dennis H.: *See*—
Peterson, Henry T.; and Hawkins, Dennis H., 4,181,249, Cl. 228-121.000.

Hawkins, James R.: *See*—
Lesieur, Roger R.; Setzer, Herbert J.; and Hawkins, James R., 4,181,503, Cl. 48-196.00A.

Hayashi, Hideyuki: *See*—
Noeami, Tomoyuki; and Hayashi, Hideyuki, 4,181,370, Cl. 303-24.00F.

Hayashi, Hiromichi: *See*—
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.

Hayashi, Satoshi: *See*—
Takeuchi, Mitsuharu; Hayashi, Satoshi; and Minemoto, Isao, 4,180,913, Cl. 433-228.000.

Hayden Nilos Conflow Limited: *See*—
Perry, Dennis A.; and Creasey, Roger H., 4,181,828, Cl. 200-18.000.

Hayes, Fay A.; and Hayes, Leonard L. Method of belling a plastic pipe. 4,181,698, Cl. 264-249.000.

Hayes, Leonard L.: *See*—
Hayes, Fay A.; and Hayes, Leonard L., 4,181,698, Cl. 264-249.000.

Headley, Verl E., to CPC International Inc. Process for producing a clean pentosan enriched pericarp. 4,181,534, Cl. 127-67.000.

Hedberg, Olle (Olof) J. G.: *See*—
Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice, 4,180,946, Cl. 51-134.50R.

Hederich, Manfred: *See*—
Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, 4,181,788, Cl. 526-68.000.

Heeres, Jan, to Janssen Pharmaceutica N.V. Imidazole derivatives and intermediates in their preparation. 4,181,664, Cl. 549-60.000.

Heider, Ulrich, to Siemens Aktiengesellschaft. Device for printing out indices and powers in typewriters. 4,181,444, Cl. 400-568.000.

Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice. Tool holding spindle assembly particularly for a grinding machine. 4,180,946, Cl. 51-134.50R.

Heiremans, Robert; and Depuydt, Andre, to U C B, Societe Anonyme. Plastics container for pressurized carbonated beverages. 4,181,239, Cl. 220-461.000.

Heitz, Pierre, to Copagnie d'Etudes et de Realisation de Cybernetique Industrielle. Method and system for checking the introduction of a filler pipe into a tank. 4,181,160, Cl. 141-1.000.

Helix Technology Corporation: *See*—
Chellis, Fred F., 4,180,984, Cl. 62-6.000.

Hellman, Erkki, to Oy Wartsila AB. Bicycle lock. 4,180,998, Cl. 70-227.000.

Helm, Homer E., to Cork, Gordon H. Releasable tube coupling. 4,181,329, Cl. 285-3.000.

Hempel, Robert P., Jr.; and Rondelli, Elder. Machine for sealing food containers. 4,180,959, Cl. 53-334.000.

Henderson, John G. N., to RCA Corporation. Liquid crystal channel number display responsive to ambient light level. 4,181,916, Cl. 358-27.000.

Hendry, Stephen M. Cryogenic, underwater-breathing apparatus. 4,181,126, Cl. 128-201.210.

Henke, Arthur W.: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., 4,180,876, Cl. 4-321.000.

Henke, John R., to Dean Research Corporation. Apparatus for lifting sheet material. 4,181,341, Cl. 294-67.00R.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Koch, Karl H., 4,181,624, Cl. 252-182.000.

Hensley, Albert L., Jr.: *See*—
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,181,602, Cl. 208-216.0PP.

Hentze, Paul W.: *See*—
Huls, Fritz; and Hentze, Paul W., 4,181,217, Cl. 198-842.000.

Herbert, Lesley D.: *See*—
Robinson, Joseph G.; and Herbert, Lesley D., 4,181,688, Cl. 525-390.000.

Herman, Avrum S.; and Reider, Samuel B., to General Motors Corporation. Combustor support structure. 4,180,972, Cl. 60-39.320.

Herring, Clarence R.; Mattern, Taylor F.; and Radcliffe, Curtis E., to Sealco Air Controls, Inc. Ratio relay emergency valve system for vehicles. 4,181,367, Cl. 303-7.000.

Herve, Jean J.: *See*—
Smolikowski, Serge; and Herve, Jean J., 4,181,735, Cl. 424-304.000.

Herzl, Peter J., to Fischer & Porter Co. Vortex-shedding flowmeter having a sensing vane. 4,181,020, Cl. 73-194.0VS.

Hess, Don; and Hess, JoAnna B. Fingernail cleaning apparatus. 4,180,884, Cl. 15-21.00R.

Hess, JoAnna B.: *See*—
Hess, Don; and Hess, JoAnna B., 4,180,884, Cl. 15-21.00R.

Hesse, Robert H.: *See*—
Barton, Derek H. R.; and Hesse, Robert H., 4,181,655, Cl. 260-239.00D.

Hettich, Jorg: *See*—
Grass, Gerd; and Hettich, Jorg, 4,181,353, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, 4,181,354, Cl. 297-307.000.
Grass, Gerd; and Hettich, Jorg, 4,181,355, Cl. 297-307.000.

Hewing, Gunther: *See*—
Forster, Siegfried; Hewing, Gunther; and Kleeman, Manfred, 4,180,973, Cl. 60-39.51R.

Hewko, Lubomyr O., to General Motors Corporation. Speedometer drive arrangement. 4,181,030, Cl. 74-12.000.

Hewlett-Packard Company: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Welsh, Paul B.; and Van Lukas, Stephen, 4,181,613, Cl. 210-179.000.
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.

Heyke, Hans-Joachim, to Licentia Patent-Verwaltungs-G.m.b.H. Method for regulating the output power of a semiconductor laser. 4,181,901, Cl. 331-94.50S.

Heyl, John K.: *See*—
Mittelman, Phillip S.; Malin, Leon; and Heyl, John K., 4,181,955, Cl. 364-521.000.

Hieb, Arthur J. Rotisserie and brazier. 4,181,074, Cl. 99-421.0HH.

Higashio, Kiyoshi: *See*—
Arisaka, Katsuharu; Kobayashi, Seiichi; and Higashio, Kiyoshi, 4,181,007, Cl. 73-37.800.

Higaya, Toshiaki; and Ariyama, Kenzo, to Ricoh Company, Ltd. Apparatus for cleaning photosensitive member. 4,181,425, Cl. 355-15.000.

Higgins, Larry, to Leggett & Platt, Incorporated. Mattress. 4,180,877, Cl. 5-263.000.

High-Lite Corporation: *See*—
Barber, Gerald L.; and Comstock, Wayne, 4,181,929, Cl. 362-192.000.

Hill, Terence A., to Burroughs Corporation. Bi-directional override coupling. 4,180,990, Cl. 64-30.00R.

Hillier, Edward F. H. B.; and Walker, Robin A., to Dowty Seals Limited. Seals and gaskets. 4,181,313, Cl. 277-166.000.

Hinchcliffe, Dennis, to Molins, Ltd. Method and apparatus for feeding containers for rod-like articles. 4,181,212, Cl. 198-419.000.

Hirabayashi, Tetsuro; and Shishiuchi, Hiromi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Drive mechanism for a reciprocating printer carriage. 4,181,443, Cl. 400-320.000.

Hirahara, Katsuji, to FMC Corporation. Continuous pressure cooking apparatus. 4,181,072, Cl. 99-353.000.

Hirbod, Farrokh. Ski skateboard. 4,181,319, Cl. 280-221.000.

Hisada, Yoshio: *See*—
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.

Hisatomi, Masanori: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.

Hiscutt, Robert: *See*—
Burrows, Kenneth; and Hiscutt, Robert, 4,181,925, Cl. 362-29.000.

Hitachi, Ltd.: *See*—
Yamauchi, Teruo; Oyama, Yoshishige; and Miyakawa, Nobuaki, 4,181,944, Cl. 364-431.000.

Hitachi Metals, Ltd.: *See*—
Yonemitsu, Mikio, 4,181,171, Cl. 164-193.000.

Hitterdal, Allan B., to Northrop Corporation. Portable radar-detecting receiver. 4,181,910, Cl. 343-18.00E.

Hitzel, Volker; Weyer, Rudi; Geisen, Karl; and Pfaff, Werner, to Hoechst Aktiengesellschaft. Certain nicotinamido-n-benzoic acid derivatives. 4,181,658, Cl. 424-266.000.

Hixon, William K. Overload stabilizer unit for vehicle. 4,181,324, Cl. 280-713.000.

Hobbensiefken, Dean. Tag axle for sub-frame of heavy duty truck power module. 4,181,189, Cl. 180-11.000.

Hocker, Jurgen: *See*—
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,181,789, Cl. 528-73.000.

Hoechst Aktiengesellschaft: *See*—
Blume, Erich; and Schornig, Eberhard, 4,181,420, Cl. 354-299.000.

Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,181,637, Cl. 260-16.000.
Hitzel, Volker; Weyer, Rudi; Geisen, Karl; and Pfaff, Werner, 4,181,658, Cl. 424-266.000.
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, 4,181,685, Cl. 525-402.000.
Landler, Josef, 4,181,805, Cl. 548-328.000.
Steinau, Peter, 4,181,767, Cl. 428-219.000.

Hoffman, John A.: *See—*
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., 4,180,876, Cl. 4-321.000.

Hoffmann, Egbert: *See—*
Wengeler, Wilhelm; Wolstein, Friedrich; and Hoffmann, Egbert, 4,181,703, Cl. 423-167.000.

Hoffmann-La Roche Inc.: *See—*
Fischer, Ernst A., 4,181,636, Cl. 260-8.000.
Westley, John; and Liu, Chao-Min, 4,181,573, Cl. 435-119.000.

Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, to Daimler-Benz Aktiengesellschaft. Pneumatic system for a central locking system for motor vehicles actuated by a flowing medium. 4,181,191, Cl. 180-289.000.

Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Labeling apparatus and method for continuously severing labels from continuous label stock and applying the severed labels to containers. 4,181,555, Cl. 156-265.000.

Hofmann, Hans, to Getrag Getriebe- und Zahnradfabrik GmbH. Infinitely variable speed gear drive. 4,181,040, Cl. 74-677.000.

Hogg, James W., to Anchor Wire Corporation of Tennessee. Two component removable adhesive hanger. 4,181,553, Cl. 156-211.000.

Hokushin Electric Works, Ltd.: *See—*
Kobayashi, Tamotsu; Suzuki, Kazuie; and Torimaru, Takashi, 4,181,019, Cl. 73-194.0EM.

Holden, Calvin B.: *See—*
Steiger, Roger A.; and Holden, Calvin B., 4,181,583, Cl. 204-67.000.
Steiger, Roger A.; and Holden, Calvin B., 4,181,584, Cl. 204-67.000.

Holden, James J., III: *See—*
Underwood, Thomas E.; and Holden, James J., III, 4,181,940, Cl. 364-200.000.

Holland, Kenneth C.; Reed, Gary W.; and Murphy, Desmond L., to Tektronix, Inc. Hybrid cascade attenuator. 4,181,903, Cl. 333-81.00R.

Holle, Hans-Joachem; and Morlock, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of a glycidyl group containing acrylic resin and its use. 4,181,642, Cl. 260-37.0EP.

Holle, Werner; and Bruckner, Dietrich, to Ernst Leitz Wetzlar GmbH. Optical exposure measuring system for photographic cameras. 4,181,412, Cl. 354-23.00R.

Holley, Joseph A.: *See—*
Darby, Lacy B.; and Holley, Joseph A., 4,181,196, Cl. 166-361.000.

Hollowell, William M.; and Ziv, Avraham, to American Safety Equipment Corporation. Vehicle sensing inertia reel lockup inhibitors. 4,181,326, Cl. 280-806.000.

Holmberg, Krister: *See—*
Hansen, Bertil; and Holmberg, Krister, 4,181,669, Cl. 260-397.400.

Holmes, Horace D. Tapping tool for making vibration resistant prevailing torque fastener. 4,181,457, Cl. 408-217.000.

Holmes, William K., to J. I. Case Company. Spreader assembly for straddle carriers. 4,181,462, Cl. 414-460.000.

Holmgren, Bertil K. A.: *See—*
Camph, Sven E.; and Holmgren, Bertil K. A., 4,180,898, Cl. 29-402.070.

Holst, Arno: *See—*
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,181,637, Cl. 260-16.000.

Honacker, Horst; and Drlik, Romuald J., to Envirotech Corporation. Flow preconditioner for electrostatic precipitator. 4,181,509, Cl. 55-106.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,181,365, Cl. 301-67.000.
Nomura, Toshio; and Shishido, Toshimasa, 4,181,107, Cl. 123-119.00F.
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,181,102, Cl. 123-75.00B.

Honeywell Inc.: *See—*
Elias, Jack; and Bozarth, Theodore B., 4,181,842, Cl. 307-66.000.
Pinckaers, B. Hubert, 4,181,957, Cl. 364-557.000.
Wada, Norikazu, 4,181,013, Cl. 73-194.0EM.

Honeywell Information Systems, Inc.: *See—*
Avalon, Max, 4,180,893, Cl. 29-33.00K.
Lemay, Richard A.; and Curley, John L., 4,181,974, Cl. 364-900.000.

Honsberg, Wolfgang, to Du Pont de Nemours, E. I., and Company. Curable composition. 4,181,648, Cl. 260-45.75N.

Honshu Seishi Kabushiki Kaisha: *See—*
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, 4,181,565, Cl. 162-76.000.

Hood, John D.: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,181,716, Cl. 424-124.000.

Horiuchi, Goh; Yabuuchi, Seizo; Suzuki, Satoru; and Amaha, Mikio, to Asahi Breweries, Ltd. Method of preventing gushing of packaged beer. 4,181,742, Cl. 426-12.000.

Horn, Ulrich: *See—*
Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, 4,181,499, Cl. 8-26.000.

Horrocks, Donald L., to Beckman Instruments, Inc. Method and apparatus for determining random coincidence count rate in a scintillation counter utilizing the coincidence technique. 4,181,855, Cl. 250-363.00R.

Horstmann, Aloys: *See—*
Greive, Aloys; and Horstmann, Aloys, 4,180,967, Cl. 57-66.000.

Horvath, Zoltan: *See—*
Tresch, Erwin; and Horvath, Zoltan, 4,181,439, Cl. 356-338.000.

Houghton, Russell J.: *See—*
El-Kareh, Badih; Gersbach, John E.; and Houghton, Russell J., 4,181,981, Cl. 365-181.000.

Hovanic, Steven F.: *See—*
Thomas, Robert W.; and Hovanic, Steven F., 4,181,924, Cl. 361-353.000.

Hovis, James E., to Bloom Engineering Company, Inc. Method and apparatus for heating a furnace chamber. 4,181,491, Cl. 431-187.000.

Howard, John K.: *See—*
Forster, Richard G.; and Howard, John K., 4,181,942, Cl. 364-200.000.

Howell, Dione H. Waterbed frame. 4,180,878, Cl. 5-431.000.

Hubel, Clayton F. Barricade bracket. 4,181,292, Cl. 256-23.000.

Huber, Ulrich; and Wild, Hans J., to Givaudan Corporation. Process for making furanones. 4,181,666, Cl. 260-347.800.

Hudson Pulp & Paper Corp.: *See—*
Pollock, Stephen F., 4,181,068, Cl. 93-1.00A.

Hudson, William S. Pressure sensitive tape applicator apparatus. 4,181,559, Cl. 156-389.000.

Hugg, Steven B.: *See—*
Mercer, Lloyd I., Sr.; and Hugg, Steven B., 4,181,943, Cl. 364-426.000.

Hughes Aircraft Company: *See—*
Abstein, Henry T., Jr.; and Page, Dennis B., 4,181,025, Cl. 73-665.000.
Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., 4,181,026, Cl. 73-665.000.
Hall, Thomas C.; and Peters, John W., 4,181,751, Cl. 427-53.100.
Peterson, Henry T.; and Hawkins, Dennis H., 4,181,249, Cl. 228-121.000.
Talbott, Charles F., Jr., 4,181,027, Cl. 73-665.000.
Talbott, Charles F., Jr., 4,181,028, Cl. 73-665.000.
Talbott, Charles F., Jr., 4,181,029, Cl. 73-665.000.

Hughes, Thomas R.: *See—*
Miller, Stephen J.; and Hughes, Thomas R., 4,181,599, Cl. 208-79.000.

Huls, Fritz; and Hentze, Paul W., to Fritz Steller GmbH & Co. KG. Conveyor-belt drum. 4,181,217, Cl. 198-842.000.

Hundt & Weber Schalgerate GmbH: *See—*
Neuser, Johannes; and Menzel, Helmut, 4,181,838, Cl. 200-153.0LA.

Hurskainen, Oiva; and Kiraly, Franz, to Oy Wartsila AB. Cylinder lock. 4,180,999, Cl. 70-366.000.

Huston, Paul O.: *See—*
Kippel, Edward A.; and Huston, Paul O., 4,181,511, Cl. 55-274.000.
Kippel, Edward A.; and Huston, Paul O., 4,181,512, Cl. 55-274.000.

Hutton, Ronald E.: *See—*
Burley, Joseph W.; Hutton, Ronald E.; and Oakes, Vincent, 4,181,671, Cl. 260-410.600.

Huyck Corporation: *See—*
Lefkowitz, Leonard R.; and Krohn, W. Henrik, 4,181,514, Cl. 55-488.000.

Ichinohe, Eisuke, to Matsushita Electric Industrial Co., Ltd. Method of fabricating an insulated gate field effect device. 4,181,537, Cl. 148-1.500.

ICI Australia Limited: *See—*
McOnie, Malcolm P.; Roberts, Philip D.; Rose, John B.; and Englin, Boris, 4,181,787, Cl. 526-62.000.

Idel, Vladimir V. Method for working saw teeth. 4,181,045, Cl. 76-112.000.

Idemitsu Kosan Company, Ltd.: *See—*
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.

Ikemoto, Ichiro: *See—*
Kanegae, Naomichi; and Ikemoto, Ichiro, 4,181,005, Cl. 73-19.000.

Ikenoue, Shinpei; Sekikawa, Nobuyoshi; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive material having reduced fog. 4,181,530, Cl. 430-620.000.

Ikushige, Tetsuo: *See—*
Matsushita, Susumu; and Ikushige, Tetsuo, 4,181,649, Cl. 260-112.50R.

Illinois Tool Works Inc.: *See—*
Rayburn, Charles C.; and Enstrom, Robert V., 4,181,552, Cl. 156-204.000.

Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, to Bayer Aktiengesellschaft. Process for the preparation of propane-1,3-diols, disubstituted in the 2-position. 4,181,810, Cl. 568-807.000.

Imperial Chemical Industries Limited: *See—*
Shephard, Margaret C.; and Worthington, Paul A., 4,181,518, Cl. 71-76.000.

Ina, Yoshifumi, to Nippondenso Co., Ltd. Motor pump. 4,181,473, Cl. 417-365.000.

Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; and Kouyama, Toshitake, to Nippon Electric Co., Ltd. System for reducing transmis-

sion problems in a parallel digital data transmission system. 4,181,914, Cl. 358-1.000.
Inayoshi, Akio: *See—*
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
Index-Werke Kommanditgesellschaft Hahn & Tessky: *See—*
Link, Helmut F., 4,180,894, Cl. 29-36.000.
Ingham, Robert V., to United Kingdom Atomic Energy Authority. Nuclear reactor control. 4,181,569, Cl. 176-36.00R.
Ingrip Fasteners, Inc.: *See—*
Brumlik, George C., 4,180,890, Cl. 24-204.000.
Inouye, Shigeharu: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.
Institut Francais du Petrole: *See—*
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,181,618, Cl. 252-51.50A.
Institut Straumann AG: *See—*
Straumann, Fritz; and Sutter, Franz, 4,180,910, Cl. 433-173.000.
Institutul de Cercetari Pentru Industria Electrotehnica - ICPE: *See—*
Grosu, Stefan I., 4,181,868, Cl. 310-166.000.
International Business Machines Corporation: *See—*
Casey, Richard G.; Langdon, Glen G., Jr.; Mantey, Patrick E.; and Williams, Robin, 4,181,952, Cl. 364-515.000.
El-Kareh, Badih; Gersbach, John E.; and Houghton, Russell J., 4,181,981, Cl. 365-181.000.
Forster, Richard G.; and Howard, John K., 4,181,942, Cl. 364-200.000.
Marenin, George B., 4,181,934, Cl. 364-200.000.
Tseng, Samuel C., 4,181,973, Cl. 364-900.000.
Van Voorhis, David C., 4,181,977, Cl. 365-4.000.
International Fire Tool Corp.: *See—*
Piffath, Rodney S.; and Cole, John J., 4,181,493, Cl. 431-344.000.
International Harvester Company: *See—*
Rubenstein, Raymond D.; Janke, Russell E.; and Rescorla, Charles L., 4,181,611, Cl. 210-149.000.
International Standard Electric Corporation: *See—*
Adler, Reinhard; and Maatje, Henri, 4,181,945, Cl. 364-436.000.
International Telephone and Telegraph Corporation: *See—*
Bassett, James H.; and King, Paul L., 4,181,194, Cl. 182-112.000.
Borsuk, Leslie M.; and Corrales, Patrick G., 4,181,402, Cl. 350-96.210.
Kilsdonk, Jan A., 4,181,391, Cl. 339-92.00M.
Place, Harry, 4,181,887, Cl. 325-15.000.
Isaac, Timothy P. Sound projection system. 4,181,193, Cl. 181-185.000.
Isaacs, Hugh S.; and Weeks, John R., to United States of America, Energy. Corrosion monitoring apparatus. 4,181,882, Cl. 324-71.00R.
Isaacson, Leonard M.: *See—*
Rosenthal, Leo; Isaacson, Leonard M.; and Ziebarth, John A., 4,181,954, Cl. 364-520.000.
Ishida, Minoru: *See—*
Murakami, Ryoichi; Anegawa, Yukio; Ishida, Minoru; and Masada, Keizi, 4,181,539, Cl. 148-6.15R.
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, to Mitsui Polychemicals Co., Ltd. Shaped articles of ethylene-vinyl acetate copolymer having a coating of NCO-free radical-containing synthetic resin paint. 4,181,761, Cl. 428-31.000.
Ishizaki, Nobuo: *See—*
Fukuda, Takashi; Shimada, Masayoshi; Ishizaki, Nobuo; and Iwahori, Shoichi, 4,181,513, Cl. 55-316.000.
Iten, Clemens A., to American Safety Razor Company. Razor with trap door feature for making blade change. 4,180,907, Cl. 30-64.000.
Ito, Atsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control means for an automatic transmission. 4,181,204, Cl. 192-4.00A.
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, to Canon Kabushiki Kaisha. Self developing camera with film feedout control. 4,181,414, Cl. 354-83.000.
Ito, Fumio: *See—*
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Ito, Toshimichi: *See—*
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
ITT Industries, Inc.: *See—*
Klein, Otto, 4,180,900, Cl. 29-566.000.
Stahl, Torvald F., 4,181,475, Cl. 417-372.000.
Ivac Corporation: *See—*
Bailey, Wilber H., 4,181,130, Cl. 128-214.00E.
Iwahori, Shoichi: *See—*
Fukuda, Takashi; Shimada, Masayoshi; Ishizaki, Nobuo; and Iwahori, Shoichi, 4,181,513, Cl. 55-316.000.
Iwase, Tetsuo, to Sharp Kabushiki Kaisha. Electronic digital scale with a memory. 4,181,848, Cl. 235-92.0DN.
Iwata, Hiroshi; Ohtani, Takeiji; Arakawa, Seiichi; and Deguchi, Seiji, to Mitsubishi Rayon Co., Ltd. Acrylonitrile block-copolymer composition. 4,181,581, Cl. 260-42.480.
Izumi, Kazuo: *See—*
Izumi, Kazuto; and Izumi, Kazuo, 4,181,970, Cl. 364-760.000.
Izumi, Kazuto; and Izumi, Kazuo, to Nippon Telegraph and Telephone Public Corporation. Digital attenuator for compressed PCM signals. 4,181,970, Cl. 364-760.000.
J. I. Case Company: *See—*
Holmes, William K., 4,181,462, Cl. 414-460.000.
Jackson, William A.; and Jones, Hubert C., Jr., to Electronic Data Systems Corporation. Computer directed manual sorting aid. 4,181,948, Cl. 364-478.000.
Jackson, Winston J., Jr.; and Morris, John C., to Eastman Kodak Company. Liquid crystal copolyesters containing terephthalic acid, isophthalic acid, 2,6-naphthalenedicarboxylic acid and hydroquinone. 4,181,792, Cl. 528-190.000.
Jackson, Winston J., Jr.: *See—*
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,181,640, Cl. 260-30.40R.
Jagenberg-Werke Aktiengesellschaft: *See—*
Buschmann, Gerhard; Thievessen, Karl; Weiss, Peter; and Reitter, Werner, 4,181,847, Cl. 235-92.0CC.
Zodrow, Rudolf, 4,181,562, Cl. 156-568.000.
James, Rex L.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Janke, Fritz, to General Motors Corporation. Stepped-ratio gearing for motor vehicles. 4,181,036, Cl. 74-477.000.
Janke, Russell E.: *See—*
Rubenstein, Raymond D.; Janke, Russell E.; and Rescorla, Charles L., 4,181,611, Cl. 210-149.000.
Janome Sewing Machine Co., Ltd.: *See—*
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, 4,181,086, Cl. 112-158.00F.
Janssen Pharmaceutica N.V.: *See—*
Heeres, Jan, 4,181,664, Cl. 549-60.000.
Kennis, Ludo, 4,181,802, Cl. 546-199.000.
Japanese National Railways: *See—*
Shirota, Yasushi; Kishimoto, Satoru; Takeshita, Kunio; and Ando, Yoshio, 4,181,430, Cl. 356-1.000.
Jenkins, James R., to Rockwell International Corporation. Digital delay line apparatus. 4,181,975, Cl. 364-900.000.
Jensen, Floyd J., to S. C. Cabling, Inc. Fiber optic waveguide connector. 4,181,401, Cl. 350-96.210.
Jensen, Harbo P., to Chevron Research Company. Process for treating hot shale oil effluent from a retort. 4,181,596, Cl. 208-11.00R.
Jensen, James W.; and Miller, Stanley J., to Gulf & Western Manufacturing Company. Sheet material flaw detector. 4,181,015, Cl. 73-159.000.
Jensen, Jorgen, to Bruel & Kjaer Industri A/S. Method for the manufacture of a force transducer. 4,180,892, Cl. 29-25.350.
Jepson, Harold C. Golf club and face plate therefor. 4,181,306, Cl. 273-173.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
McAllister, Gary L., 4,181,898, Cl. 331-94.50S.
Joffe, Edward J. Molds for forming hamburger patties and other comestibles. 4,180,889, Cl. 17-32.000.
John, Clarence D., Jr., to Westinghouse Electric Corp. Method of assuring nuclear fuel rod pressurization during manufacture. 4,181,008, Cl. 73-52.000.
Johnson, Charles. Machine for treating pipe interiors. 4,181,092, Cl. 118-72.000.
Johnson, Edward L.: *See—*
Abu-Shumays, Ahmad; and Johnson, Edward L., 4,181,853, Cl. 250-304.000.
Johnson, Herbert G.: *See—*
Hall, Charles M.; and Johnson, Herbert G., 4,181,724, Cl. 424-250.000.
Johnson & Johnson: *See—*
Kennedy, Robert R.; Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,181,634, Cl. 252-545.000.
Linsky, Cary B.; and Rovee, David T., 4,181,127, Cl. 128-155.000.
Millet, Marcus J., 4,181,223, Cl. 206-365.000.
Johnson & Johnson Baby Products Company: *See—*
Cox, Raymond W., 4,181,218, Cl. 206-205.000.
Johnson, Lonnie G. Variable resistance type sensor controlled switch. 4,181,843, Cl. 307-116.000.
Johnson, Richard A.: *See—*
Zuvela, Bernard R.; Teys, Raymond W.; and Johnson, Richard A., 4,181,014, Cl. 73-151.000.
Johnson, Richard D.: *See—*
Havera, Herbert J.; Vidrio, Horacio; and Johnson, Richard D., 4,181,657, Cl. 424-256.000.
Johnson, Richard N., to United States of America, Army. Method and apparatus for forming convolutions of two complex number sequences using the fermat number transform. 4,181,968, Cl. 364-728.000.
Johnson, Roy A., to Upjohn Company, The. 5-Keto prostaglandin Fα analogs. 4,181,808, Cl. 560-121.000.
Jolly, Robert, to United Kingdom Atomic Energy Authority. Nuclear reactor with fuel pin bracing grid. 4,181,571, Cl. 176-40.000.
Jones, Dale A. Wood splitting implement. 4,181,166, Cl. 145-2.00R.
Jones, Hubert C., Jr.: *See—*
Jackson, William A.; and Jones, Hubert C., Jr., 4,181,948, Cl. 364-478.000.
Jones, James E.: *See—*
Seymour, Merritt W.; and Jones, James E., 4,180,874, Cl. 4-173.00M.

Jones & Laughlin Steel Corporation: *See*—
Bucher, John H.; and Paliwoda, Eugene J., 4,181,524, Cl. 75-123.00G.
Jones Plastic & Engineering Corporation: *See*—
Boon, Daniel A.; Jones, R. Larry; and Shelton, Naaman, Jr., 4,181,037, Cl. 74-569.000.
Jones, R. Larry: *See*—
Boon, Daniel A.; Jones, R. Larry; and Shelton, Naaman, Jr., 4,181,037, Cl. 74-569.000.
Jordan, Alfred. Rotary internal combustion engine. 4,181,481, Cl. 418-253.000.
Juengel, Richard O.; and Cook, Kenneth J., to Valeron Corporation, The. Multiple probe gage system. 4,181,958, Cl. 364-560.000.
Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Schatz, Friedrich; Marx, Karl-Heinz; and Rohner, Peter, 4,181,543, Cl. 148-127.000.
Kabushiki Kaisha Nagano Keiki Seisakusho: *See*—
Kiuchi, Mitsuhiro, 4,181,012, Cl. 73-141.00A.
Kabushiki Kaisha Suwa Seikosha: *See*—
Hirabayashi, Tetsuro; and Shishiuchi, Hiromi, 4,181,443, Cl. 400-320.000.
Naito, Okito, 4,180,969, Cl. 58-42.500.
Tokunaga, Ikuo; Uchiyama, Hideaki; and Fujimori, Yoshiaki, 4,180,970, Cl. 58-57.500.
Kabushiki Kaisha Tokyo Bebi: *See*—
Toda, Tokuzo, 4,181,317, Cl. 280-42.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Baysinger, Frank R., 4,181,235, Cl. 220-5.00A.
Kaiser, Kenneth L.: *See*—
Stowik, William J.; and Kaiser, Kenneth L., 4,180,944, Cl. 49-504.000.
Kaji, Hidehiko: *See*—
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
Kakutani, Nobuyasu: *See*—
Tateishi, Iwao; and Kakutani, Nobuyasu, 4,181,960, Cl. 364-562.000.
Kallis, James M.: *See*—
Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., 4,181,026, Cl. 73-665.000.
Kaltenberg, Theodor W.: *See*—
Cofer, Daniel B.; Chia, Enrique C.; Burnitte, John E.; and Kaltenberg, Theodor W., 4,181,091, Cl. 118-63.000.
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, to Fujisawa Pharmaceutical Co., Ltd. 2-Azetidinone compounds and processes for preparation thereof. 4,181,800, Cl. 544-180.000.
Kamiya, Yoji: *See*—
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.
Kampe, Marcis M.: *See*—
Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., 4,181,660, Cl. 548-110.000.
Kanai, Takeo: *See*—
Morita, Eiichi; and Kanai, Takeo, 4,181,803, Cl. 546-237.000.
Kanegae, Naomichi; and Ikemoto, Ichiro, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Hydrogen detector. 4,181,005, Cl. 73-19.000.
Karinthi, Pierre: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,181,522, Cl. 75-96.000.
Karisik, Mustafa: *See*—
Radulovic, Radoje; Karisik, Mustafa; and Wolfer, Klaus R., 4,180,870, Cl. 3-1.200.
Karlovits, Frank K., to Eaton Corporation. Ice cube dispenser with rotor feed means. 4,181,244, Cl. 222-227.000.
Kasagi, Ryoichi. Metal melt-spraying method and equipment. 4,181,256, Cl. 239-81.000.
Kasper Instruments, Inc.: *See*—
Szasz, Peter R.; and Schulte, Harvey L., 4,181,214, Cl. 198-467.000.
Kato, Kenji; and Tanaka, Haruhiko. Speed control circuit for electric motors. 4,181,876, Cl. 318-345.00G.
Kato, Toshiro: *See*—
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.
Katoh, Kazumasa: *See*—
Takagi, Yasuo; and Katoh, Kazumasa, 4,180,975, Cl. 60-290.000.
Katou, Tuneo: *See*—
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.
Kaufman, Jack W. Pre-operative surgical scrubber. 4,181,446, Cl. 401-9.000.
Kawada, Shigeki: *See*—
Kohzai, Yoshinori; Kawada, Shigeki; and Oyama, Shigeaki, 4,181,875, Cl. 318-252.000.
Kawaguchi, Hiroshi; Tsukiura, Hiroshi; and Tomita, Koji, to Bristol-Myers Company. Production of antibiotics by fermentation of novel strains of *Micropolyspora caesia*. 4,181,574, Cl. 435-77.000.
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Wheels for motorcycles. 4,181,365, Cl. 301-67.000.
Kawakami, James H.: *See*—
Ward, Robert J.; Kawakami, James H.; and McCarthy, Neil J., Jr., 4,181,687, Cl. 525-100.000.
Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronic shutter control circuit. 4,181,413, Cl. 354-24.000.
Kawasaki, Masahiro: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,181,411, Cl. 354-53.000.
Kawasaki, Motojiro. Lifesaving air boat. 4,180,882, Cl. 9-11.00A.
Keeler Corporation: *See*—
Stelma, Gerard N., 4,181,333, Cl. 292-66.000.
Keese, Charles R.; Giaever, Ivar; and Ward, William J., III, to General Electric Company. Method and apparatus for measuring antibody levels. 4,181,501, Cl. 23-230.00B.
Keith, John C.: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.
Keller, Wilbur S.; and Vanderford, William D., to Dresser Industries, Inc. Thrust flange actuated rock bit lubrication system. 4,181,185, Cl. 175-229.000.
Kellner, Gerd: *See*—
Klier, Hermann; Kellner, Gerd; and Mayer, Johann, 4,181,079, Cl. 102-56.0SC.
Kennedy, Robert R.; Lindemann, Martin K. O.; and Verdicchio, Robert J., to Johnson & Johnson. Mild cleansing compositions comprising an alkyleneoxylated bisquaternary ammonium compound and an anionic or amphoteric detergent such as a phosphobetaine. 4,181,634, Cl. 252-545.000.
Kennis, Ludo, to Janssen Pharmaceutica N.V. 1-(Heterocyclylalkyl)-1,3-dihydro-2-H-benzimidazole-2-ones. 4,181,802, Cl. 546-199.000.
Kent, Harry A., Jr., to Research Corporation. Ovulation enhancing peptides. 4,181,717, Cl. 424-177.000.
Kent, William H.; and Nardi, Anthony P., to Sperry Rand Corporation. Geothermal energy pump monitor and telemetric system. 4,181,468, Cl. 417-63.000.
Kenyon, John W.; Shockley, Lestle R.; and Van Niel, Paul R., to Chicago Bridge & Iron Company. Liquid storage tank with welded joint drain canal system and wall stiffener system. 4,181,237, Cl. 220-71.000.
Kepets, Peter. Kit for processing printed circuit boards. 4,181,222, Cl. 206-223.000.
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, to Hoechst Aktiengesellschaft. Thermoplastic molding compositions on the basis of polyoxymethylenes. 4,181,685, Cl. 525-402.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Forster, Siegfried; Hewing, Gunther; and Kleeman, Manfred, 4,180,973, Cl. 60-39.51R.
Kertesz, Denis J.: *See*—
Marx, Michael; and Kertesz, Denis J., 4,181,720, Cl. 424-241.000.
Kesling, Peter C. Orthodontic light wire appliance. 4,180,912, Cl. 433-13.000.
Kessler, Milton. Vacuum sizing apparatus. 4,181,487, Cl. 425-326.100.
Kessler, Rolf E.; Papajewski, Reinhold; and Polixa, Dietmar, to Singer Company, The. Underbed thread trimmer for sewing machines. 4,181,088, Cl. 112-292.000.
Ketteler, Otto; and Gielsok, Hans-Peter, to C. Keller GmbH u. Co. KG. Reeling device for veneer band. 4,181,269, Cl. 242-65.000.
Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Process for the cleaning of fouled heat exchangers and other equipment. 4,181,536, Cl. 134-2.000.
Khalafalla, Sanaa E.: *See*—
Schiller, Joseph E.; and Khalafalla, Sanaa E., 4,181,607, Cl. 210-36.000.
Kickle, Hunter L.; Ball, William J., Jr.; and Von Schanefelt, Robert, to A. E. Staley Manufacturing Company. Processed vegetable seed fiber for food products. 4,181,747, Cl. 426-615.000.
Kida, Hideki: *See*—
Ubukata, Morio; and Kida, Hideki, 4,180,920, Cl. 35-9.00D.
Kidd, Robert L., to Fleming, Ray Frost. Portable table loom. 4,181,158, Cl. 139-33.000.
Kienzle Apparate GmbH: *See*—
Haller, Karl-Heinz; and Muller, Helmut, 4,181,445, Cl. 400-632.100.
Kiesel, George W.; and Willard, Henry G., to General Electric Company. Tap changing electrical connector for static trip circuit breakers. 4,181,389, Cl. 339-32.00M.
Kikagaku Kenkyusho: *See*—
Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, 4,181,714, Cl. 424-117.000.
Kilsdonk, Jan A., to International Telephone and Telegraph Corporation. Polarized electrical connector. 4,181,391, Cl. 339-92.00M.
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., to Gulf Oil Corporation. Method for manufacture of olefin polymer fibrils. 4,181,794, Cl. 528-496.000.
Kimberley, Ivan E., to West's Pyro Limited. Process for treating drilling cuttings and mud. 4,181,494, Cl. 432-2.000.
Kinder, Mark R.: *See*—
Rau, Jim L.; and Kinder, Mark R., 4,181,042, Cl. 74-750.00R.
King, Arthur S. Electrostatic and electrolytic clarifier apparatus. 4,181,591, Cl. 204-275.000.
King, Paul L.: *See*—
Bassett, James H.; and King, Paul L., 4,181,194, Cl. 182-112.000.
Kinoshita, Tatsuo, to Mitsui Petrochemical Industries, Ltd. Room-temperature curable elastic composition. 4,181,645, Cl. 260-42.280.
Kippel, Edward A.; and Huston, Paul O., to Becton, Dickinson and Company. Bacteria filters with transparent housings. 4,181,511, Cl. 55-274.000.

Kippel, Edward A.; and Huston, Paul O., to Becton, Dickinson and Company. Bacteria filters with transparent housings. 4,181,512, Cl. 55-274.000.

Kiraly, Franz: *See*—
Hurskainen, Oiva; and Kiraly, Franz, 4,180,999, Cl. 70-366.000.

Kiritani, Masataka: *See*—
Satomura, Masato; Kiritani, Masataka; and Nishimura, Taiichi, 4,181,328, Cl. 282-27.500.

Kishimoto, Satoru: *See*—
Shirota, Yasushi; Kishimoto, Satoru; Takeshita, Kunio; and Ando, Yoshio, 4,181,430, Cl. 356-1.000.

Kitayama, Minoru; Saito, Takao; and Wake, Ryousuke, to Nippon Steel Corporation. Process for electro-tin plating. 4,181,580, Cl. 204-28.000.

Kitchen, Clarence E.; and Wegmann, Jerome B., to McNeil Corporation. Expansible chamber motor. 4,181,066, Cl. 91-306.000.

Kitrosser, Samuel, to Cordell Engineering, Inc. Film processing. 4,181,421, Cl. 354-321.000.

Kitzinger, Frank, to Noranda Mines Limited. Apparatus for detecting the presence of a specific substance in a gas stream. 4,181,699, Cl. 422-87.000.

Kiuchi, Mitsuhiro, to Kabushiki Kaisha Nagano Keiki Seisakusho. Device for converting mechanical quantities into electrical quantities. 4,181,012, Cl. 73-141.00A.

Kiyohara, Takao: *See*—
Yoshida, Noboru; Kiyohara, Takao; and Ogino, Shigeo, 4,181,731, Cl. 424-273.00R.

Klaassen, Vello: *See*—
Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice, 4,180,946, Cl. 51-134.50R.

Kleeman, Manfred: *See*—
Forster, Siegfried; Hewing, Gunther; and Kleeman, Manfred, 4,180,973, Cl. 60-39.51R.

Klein, Otto, to ITT Industries, Inc. Apparatus for making a commutator for an electric motor. 4,180,900, Cl. 29-566.000.

Klein, Walter: *See*—
Wasmund, Heiko; and Klein, Walter, 4,181,436, Cl. 356-225.000.

Klett, Gene R.; and Lanz, William E., to Caterpillar Tractor Co. Load absorbing means for cutting edge assembly. 4,180,926, Cl. 37-142.00R.

Klier, Hermann; Kellner, Gerd; and Mayer, Johann, to Messerschmitt-Bolkow-Blohm GmbH. Hollow charge ammunition construction. 4,181,079, Cl. 102-56.0SC.

Klimashko, Vladimir V.: *See*—
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.

Klinke, Bernhard R. Detachable link. 4,180,971, Cl. 59-87.000.

Klinkhammer, Ralf L.; and Klotz, Artur, to AGFA-Gevaert, A.G. Automatic loading device for roll films. 4,180,905, Cl. 29-786.000.

Klotz, Artur: *See*—
Klinkhammer, Ralf L.; and Klotz, Artur, 4,180,905, Cl. 29-786.000.

Kluczynski, Achim; and Altmann, Erik, to AGFA-Gevaert, A.G. Spool with external hooks for winding material in the form of tape. 4,181,271, Cl. 242-74.000.

Knape, Richard S.; and Moreau, Richard A., to General Motors Corporation. Injection timing nozzle. 4,181,010, Cl. 73-119.00A.

Knox, Lloyd C.; and Streich, Steven G., to Halliburton Company. Pile wiper seal. 4,181,454, Cl. 405-227.000.

Ko, Keido: *See*—
Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, 4,181,714, Cl. 424-117.000.

Kobayashi, Kazuo: *See*—
Takemoto, Yasunori; Asanomi, Koji; and Kobayashi, Kazuo, 4,181,105, Cl. 123-117.00A.

Kobayashi, Seiichi: *See*—
Arisaka, Katsuharu; Kobayashi, Seiichi; and Higashio, Kiyoshi, 4,181,007, Cl. 73-37.800.

Kobayashi, Tamotsu; Suzuki, Kazuie; and Torimaru, Takashi, to Hokushin Electric Works, Ltd. Electromagnetic flowmeter with noise compensation. 4,181,019, Cl. 73-194.0EM.

Kobayashi, Yasuhisa: *See*—
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,181,365, Cl. 301-67.000.

Kobe Steel, Limited: *See*—
Sano, Tsutomu; Takeuchi, Naoki; Kurumaji, Masanobu; and Nakatsukasa, Susumu, 4,181,510, Cl. 55-183.000.

Kober, Rudolf, to Siemens Aktiengesellschaft. Data exchange processor for distributed computing system. 4,181,936, Cl. 364-200.000.

Koch, Karl H., to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Aminoalkanols. 4,181,624, Cl. 252-182.000.

Koch, Keith E.: *See*—
Grawey, Charles E.; Untz, Robert W.; and Koch, Keith E., 4,181,169, Cl. 152-404.000.

Kockott, Dieter; and Bensel, Joachim, to Original Hanau Quartzlampen GmbH. Illuminating fixture for surgical light. 4,181,926, Cl. 362-33.000.

Kodaka, Takayuki: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,181,542, Cl. 148-187.000.

Kofford, Emanuel J. Lifting device for jar lid assemblies. 4,181,340, Cl. 294-65.500.

Koffski, Leonard E. Wall lifter. 4,181,289, Cl. 254-107.000.

Kogure, Hiroshi: *See*—
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,181,102, Cl. 123-75.00B.

Kogure, Yasuyuki; and Okada, Yoneo, to Fuji Jukogyo Kabushiki Kaisha. Safety device in aircraft high-lift device. 4,181,276, Cl. 244-215.000.

Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for internal combustion engine. 4,181,110, Cl. 123-119.00A.

Kohara, Rikusei; and Aoyama, Takashi, to Matsushita Electric Industrial Co., Ltd. Electrochromic display device. 4,181,406, Cl. 350-357.000.

Kohoutek, Jindrich: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.

Kohyama, Susumu, to Tokyo Shibaura Electric Co., Ltd. Sensing circuit for a multi-level signal charge. 4,181,865, Cl. 307-361.000.

Kohzai, Yoshinori; Kawada, Shigeki; and Oyama, Shigeaki, to Fujitsu Fanuc Limited. Drive circuit for a DC motor. 4,181,875, Cl. 318-252.000.

Koizumi, Junji: *See*—
Toda, Yuzo; Mukunoki, Yasuo; and Koizumi, Junji, 4,181,527, Cl. 430-543.000.

Kojima, Noriatsu. Horn shaped multi-inlet pipe fitting. 4,181,330, Cl. 285-127.000.

Kokelenberg, Hendrik E.: *See*—
Sels, Francis J.; Kokelenberg, Hendrik E.; and Van Veelen, George F., 4,181,529, Cl. 430-626.000.

Kolenik, Steve A.; and Walters, Robert A., to Arco Medical Products Company. Programmable tachycardia pacer. 4,181,133, Cl. 128-419.0PG.

Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, to Ciba-Geigy Corporation. Process for the level dyeing of polyacrylonitrile materials of slow, normal and rapid absorptive capacity. 4,181,499, Cl. 8-26.000.

Koltai, Paul; and Robert, Georg, to Sandoz Ltd. Dyeing and printing with synthetic thickeners. 4,181,498, Cl. 8-18.00A.

Kondo, Keiko: *See*—
Ohtaki, Syohei; Kondo, Keiko; Nakamura, Zenzo; and Okuno, Youichi, 4,181,416, Cl. 354-106.000.

Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, to Meiji Seika Kaisha Ltd. Novel antibiotic substance SF-1540 and its derivative, and process for the production thereof. 4,181,715, Cl. 424-122.000.

Konno, Tsugio: *See*—
Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, 4,181,694, Cl. 264-41.000.

Kononov, Ivan V.; Makushin, Mikhail P.; Polukhin, Dmitry I.; Popov, Vyacheslav E.; and Salov, Viktor P. Hydraulic screw press drive. 4,181,003, Cl. 72-441.000.

Kopp, Georg, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for stacking filled bags. 4,181,052, Cl. 83-79.000.

Koppers Company, Inc.: *See*—
Nolden, Kurt, 4,181,507, Cl. 55-73.000.

Korematsu, Joe. Bean sprouter. 4,180,941, Cl. 47-14.000.

Korman, Samuel: *See*—
Sheer, Charles; Korman, Samuel; and Schaffel, Gerson S., 4,181,704, Cl. 423-230.000.

Kosak, Kerry D. Articulated multi-swivel chair. 4,181,281, Cl. 248-416.000.

Koschinek, Gunter; and Wandel, Dietmar, to Zimmer Aktiengesellschaft. Process for high-speed spinning of polyamides. 4,181,697, Cl. 264-176.00F.

Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B. Device for forming underground pipelines. 4,181,484, Cl. 425-59.000.

Kouyama, Toshitake: *See*—
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; and Kouyama, Toshitake, 4,181,914, Cl. 358-1.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Becker, Bernard, 4,181,038, Cl. 74-574.000.

Kral, Milos: *See*—
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,181,083, Cl. 112-67.000.

Kraus, Thaddaus, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Method of producing a high vacuum in a container. 4,181,161, Cl. 141-8.000.

Krause Erich both of: *See*—
Schieber, Hans; Krause Erich both of; and Schimko, Reinhold, 4,180,992, Cl. 66-75.100.

Krause, Joachim: *See*—
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,181,625, Cl. 252-299.000.

Krauss, Dale A.; and Chang, Robin L., to Rapistan, Incorporated. Conveyor sorting system. 4,181,947, Cl. 364-478.000.

Krauss, Heinz: *See*—
Ruf, Walter; and Krauss, Heinz, 4,181,113, Cl. 123-148.00E.

Kreibich, Ursula; and Schmid, Rolf, to Ciba-Geigy Corporation. Process for the manufacture of crystalline, crosslinked epoxide resins. 4,181,643, Cl. 260-40.00R.

Krene, Joseph I.; and Campbell, William T. Golf training device. 4,181,307, Cl. 273-183.00A.

Krimm, Heinrich: *See*—
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,181,676, Cl. 260-463.000.
Krohn, W. Henrik: *See*—
Lefkowitz, Leonard R.; and Krohn, W. Henrik, 4,181,514, Cl. 55-488.000.
Kroniger, Wilhelm, to Dr. Ing. h.c.F. Porsche AG, Firma. Wheel suspension arrangement for motor vehicles. 4,181,322, Cl. 280-699.000.
Krstich, Paul. Computer cable shroud assembly. 4,180,955, Cl. 52-221.000.
Kruger, Hans-Rudolf; Rusch, Reinhart; and Arndt, Friedrich, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-2-id derivatives, process for making the same and composition containing the same having a growth regulating activity for plants. 4,181,517, Cl. 71-73.000.
Kruse, Clifford L. Heat generation by frictional vaporization. 4,181,098, Cl. 122-26.000.
Kuhfuss, Herbert F.: *See*—
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,181,640, Cl. 260-30.40R.
Kuki, Tamaki: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,181,542, Cl. 148-187.000.
Kulle, Lee K.: *See*—
Garrett, Scott T.; Kulle, Lee K.; and Rudzena, William L., 4,181,245, Cl. 222-450.000.
Kulwicki, Bernard M., to Texas Instruments Incorporated. Compact PTC resistor. 4,180,901, Cl. 29-621.000.
Kume, Toshiaki: *See*—
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, 4,181,086, Cl. 112-158.00F.
Kunii, Yutaka; and Shimoji, Toshikuni, to Tokyo Shibaura Electric Co., Ltd. Vessel for ultrasonic scanner. 4,181,120, Cl. 128-660.000.
Kunz, Ruediger: *See*—
Moelter, Gunther; Mueller, Hermann; and Kunz, Ruediger, 4,181,275, Cl. 244-213.000.
Kuraray Co., Ltd.: *See*—
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, 4,181,228, Cl. 209-552.000.
Takamatsu, Hideo; Minatono, Shobu; Terao, Katsuyoshi; and Yamauchi, Junnosuke, 4,181,635, Cl. 260-5.000.
Kurtz, Bruce E., to Allied Chemical Corporation. Process for producing chlorine and caustic soda. 4,181,587, Cl. 204-98.000.
Kurumaji, Masanobu: *See*—
Sano, Tsutomu; Takeuchi, Naoki; Kurumaji, Masanobu; and Nakatsukasa, Susumu, 4,181,510, Cl. 55-183.000.
Kyonomine, Masaru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pedal stopper parking brake switch. 4,181,834, Cl. 200-61.890.
La Fata, John E.; and Cuccio, John D. Bubble blowing wand. 4,180,938, Cl. 46-6.000.
Laar, Erwin; Ganser, Friedrich; and Hammer, Thomas, to AGFA-Gevaert, A.G. Apparatus for winding webs of photographic paper of the like. 4,181,270, Cl. 242-66.000.
Laboratoires Jacques Logeais: *See*—
Maillard, Jacques G., 4,181,736, Cl. 424-317.000.
Lachnit-Fixson, Ursula: *See*—
Speck, Ulrich; Pinter, Erwig; Lachnit-Fixson, Ursula; and Hahn-Godeffroy, Johann-Diederich, 4,181,721, Cl. 424-243.000.
Lagoni, William A., to RCA Corporation. LED Channel number display responsive to ambient light level. 4,181,915, Cl. 358-27.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Galey, Jean; Bentz, Gerard; Karinthi, Pierre; Gilbert, Ghislain; and Devalois, Serge, 4,181,522, Cl. 75-96.000.
Grenier, Maurice, 4,181,174, Cl. 165-180.000.
Lamb, Terrence R. Hand-held canvas stretching apparatus. 4,181,046, Cl. 81-5.10R.
Land, Edwin H., to Polaroid Corporation. Novel battery anode. 4,181,778, Cl. 429-53.000.
Landen, Ernest W., to Caterpillar Tractor Co. Hydraulically limited fuel injection nozzle. 4,181,144, Cl. 137-484.400.
Landler, Josef, to Hoechst Aktiengesellschaft. Process for the preparation of pure sodium hydroxide addition compounds of cis-isomers of naphthoylene-bis-benzimidazoles. 4,181,805, Cl. 548-328.000.
Lang, Gunter: *See*—
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, 4,181,575, Cl. 435-11.000.
Langdon, Glen G., Jr.: *See*—
Casey, Richard G.; Langdon, Glen G., Jr.; Mantey, Patrick E.; and Williams, Robin, 4,181,952, Cl. 364-515.000.
Lange, Emroy W.: *See*—
Matsko, Joseph J.; Lange, Emroy W.; and Skalka, Paul, 4,181,906, Cl. 335-6.000.
Lange, Gunther, to Lemforder Metallwaren AG. Universal joint construction. 4,180,989, Cl. 64-17.00R.
Lanz, William E.: *See*—
Klett, Gene R.; and Lanz, William E., 4,180,926, Cl. 37-142.00R.
Laribee, Ralph S., to Leigh Products, Inc. Handrail support hardware. 4,181,293, Cl. 256-67.000.
Laroche Navarron S.A.: *See*—
Beranger, Serge; and Pinhas, Henri, 4,181,722, Cl. 424-250.000.
Larson, Ivar W.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Larsson, Sture V.: *See*—
Heijkenskjold, Mats C. D.; Hedberg, Olle (Olof) J. G.; Klaassen, Vello; Larsson, Sture V.; Habermann, Helmut; and Brunet, Maurice, 4,180,946, Cl. 51-134.50R.
Lasher, Edward A. High solids polyester resin-based coating composition and method of making same. 4,181,638, Cl. 260-22.00R.
Laskowski, Kenneth W.: *See*—
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.
Latasiewicz, Leonard, to Motorola, Inc. Dome switch actuating apparatus. 4,181,826, Cl. 200-340.000.
LaVene, Leon F.: *See*—
Benjamin, Benjamin C.; and LaVene, Leon F., 4,181,065, Cl. 91-167.00R.
Lawlor, Robert E. Golf tee with line-of-flight indicator. 4,181,311, Cl. 273-206.000.
Leak, John; and Miller, Aaron, Jr., to Boeing Company, The. Helicopter rotor system related vibration amplitude detecting system. 4,181,024, Cl. 73-660.000.
Leatherman, Ivan R., to PPG Industries, Inc. Method of preparing tungsten hexacarbonyl containing polymers and polymers prepared thereby. 4,181,626, Cl. 252-300.000.
Lebrecht, Horst, to Master Lock Company. Padlock cylinder retainer block securing means. 4,180,996, Cl. 70-52.000.
Lechner, Helmut. Self-locking telescopic extensible rule. 4,180,914, Cl. 33-161.000.
Lee, Gene D.: *See*—
Moore, James H.; and Lee, Gene D., 4,181,964, Cl. 364-708.000.
Lee, Paul J.: *See*—
Taylor, Robert E.; and Lee, Paul J., 4,181,921, Cl. 361-56.000.
Lefkowitz, Leonard R.; and Krohn, W. Henrik, to Huyck Corporation. Stitch knitted filters for high temperature fluids and method of making them. 4,181,514, Cl. 55-488.000.
LeFrancois, Philippe, to Vide et Traitement S.A. Thermochemical treatment system and process. 4,181,541, Cl. 148-16.600.
Leggett & Platt, Incorporated: *See*—
Higgins, Larry, 4,180,877, Cl. 5-263.000.
Legrand, Maurice: *See*—
Cholat-Serpoud, Gerard; and Legrand, Maurice, 4,181,301, Cl. 273-73.00C.
Legros, Jean: *See*—
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,181,719, Cl. 424-233.000.
Lehr, Marvin H., to B. F. Goodrich Company, The. Impact modified polymer composition. 4,181,644, Cl. 260-42.180.
Leifheit International Gunter Leifheit GmbH: *See*—
Schulein, Rolf G., 4,181,163, Cl. 141-381.000.
Leigh Products, Inc.: *See*—
Laribee, Ralph S., 4,181,293, Cl. 256-67.000.
Lemay, Richard A.; and Curley, John L., to Honeywell Information Systems, Inc. System providing multiple outstanding information requests. 4,181,974, Cl. 364-900.000.
Lemelson, Jerome H.: *See*—
Brumlick, George C.; and Lemelson, Jerome H., 4,181,743, Cl. 426-241.000.
Lemforder Metallwaren AG: *See*—
Lange, Gunther, 4,180,989, Cl. 64-17.00R.
Lemon, Maurice C.; and Spear, John F., to Universal Towel Company Limited. Washing machines. 4,180,994, Cl. 68-18.00F.
Lenker, Earl A. Paving joints. 4,181,449, Cl. 404-87.000.
Leo Pharmaceutical Products Ltd. A/S: *See*—
Hansen, Kai, 4,181,659, Cl. 424-271.000.
Le Peutrec, Roger: *See*—
Maginot, Pierre; and Le Peutrec, Roger, 4,180,983, Cl. 60-657.000.
Lepley, Joseph: *See*—
Beeghly, Bruce R.; and Lepley, Joseph, 4,181,883, Cl. 324-166.000.
Lesieur, Roger R.; Setzer, Herbert J.; and Hawkins, James R., to United Technologies Corporation. Process for alternately steam reforming sulfur containing hydrocarbons that vary in oxygen content. 4,181,503, Cl. 48-196.00A.
Letts, Robert A., to Airscrew Howden Limited. Bearing structure lubricant feed system. 4,181,379, Cl. 308-187.000.
Levine, Robert A.: *See*—
Wardlaw, Stephen C.; Massey, James V., III; and Levine, Robert A., 4,181,609, Cl. 210-72.000.
Liang, Chi-Dean, to G. D. Searle & Co. Phenyl 5Z,8Z,11Z,14Z-eicosatetraenoate and. 4,181,670, Cl. 260-410.500.
Licentia Patent-Verwaltungs-G.m.b.H: *See*—
Schroder, Ernst, 4,181,896, Cl. 330-282.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Heyke, Hans-Joachim, 4,181,901, Cl. 331-94.50S.
Liebig, Lothar: *See*—
Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, 4,181,788, Cl. 526-68.000.
Lighting Systems, Inc.: *See*—
Zelina, Thomas, 4,181,928, Cl. 362-184.000.
Lightolier Incorporated: *See*—
Donato, Anthony C., 4,181,388, Cl. 339-21.00R.
Lill, John F., to AMP Incorporated. Interconnecting means for coil windings and overload protector. 4,181,393, Cl. 339-98.000.
Lill, Melvin H.; and Wiederrich, James L., to FMC Corporation. Runout compensation in vehicle wheel alignment measuring apparatus. 4,180,915, Cl. 33-228.000.

Lind, Anders. Knife with exchangeable blades. 4,180,909, Cl. 30-332.000.
Lindberg, Torsten G., to AB Volvo. Energy absorber, especially for motor vehicles. 4,181,198, Cl. 188-1.00C.
Lindemann, Martin K. O.: *See*—
Kennedy, Robert R.; Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,181,634, Cl. 252-545.000.
Lindqvist, Jonas H. Oscillating movement damping means intended for pivotally suspended hoisting gear. 4,181,343, Cl. 294-86.00R.
Lindsay, Creo B.: *See*—
Forte, Jimmy L.; and Lindsay, Creo B., 4,180,988, Cl. 62-474.000.
Lindsay, Erin J.: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., 4,180,876, Cl. 4-321.000.
Lindstrom, Olle B., to AB Olle Lindstrom. Chemoelectric cell. 4,181,776, Cl. 429-27.000.
Linford, John R.: *See*—
Nash, Harold G.; and Linford, John R., 4,181,967, Cl. 364-724.000.
Link, Helmut F., to Index-Werke Kommanditgesellschaft Hahn & Tessky. Automatic turret lathe. 4,180,894, Cl. 29-36.000.
Linsky, Cary B.; and Rovee, David T., to Johnson & Johnson. Balanced environment wound dressing. 4,181,127, Cl. 128-155.000.
Lion Hamigaki Kabushiki Kaisha: *See*—
Takeuchi, Mitsuharu; Hayashi, Satoshi; and Minemoto, Isao, 4,180,913, Cl. 433-228.000.
Lipovetsky, Lazar M.: *See*—
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Litovits, Theodore Aaron: *See*—
Macedo, Pedro B.; Mohr, Robert K.; and Gupta, Prabhat K., 4,181,403, Cl. 350-96.330.
Litt, Kenneth C., to Pace Incorporated. Pump valve. 4,181,477, Cl. 417-560.000.
Litton Systems, Inc.: *See*—
Buck, Ronald G., 4,181,744, Cl. 426-233.000.
Liu, Chao-Min: *See*—
Westley, John; and Liu, Chao-Min, 4,181,573, Cl. 435-119.000.
Liu, Shing-Gong; and Duigon, Ferdinand C., to RCA Corporation. Thin film pattern generation by an inverse self-lifting technique. 4,181,755, Cl. 430-314.000.
Liu, Yung S., to General Electric Company. High power optical second harmonic generation in non-linear crystals. 4,181,899, Cl. 331-94.50C.
Loewe Anstalt: *See*—
Fehlmann, Hans-Beat, 4,181,556, Cl. 156-292.000.
Loire, Rene: *See*—
Pagezy, Michel J.; and Loire, Rene, 4,181,452, Cl. 405-203.000.
Lonati, Francesco, to Costruzioni Meccaniche Lonati S.p.A. Method and double-cylinder circular knitting machine for manufacturing patterned knitted fabrics. 4,180,991, Cl. 66-14.000.
Longaker, C. D. Lowell: *See*—
Atkinson, Kenneth W.; and Longaker, C. D. Lowell, 4,181,309, Cl. 273-186.00R.
Longhouse, Richard E., to General Motors Corporation. Fan shroud arrangement. 4,181,172, Cl. 165-51.000.
Lonza, Ltd.: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,181,628, Cl. 252-435.000.
L'Orange, Raul: *See*—
Raaf, Helmut; L'Orange, Raul; and Harth, Helmut, 4,181,621, Cl. 252-102.000.
Lorenz, Kurt: *See*—
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, 4,181,706, Cl. 423-237.000.
Loshbough, Richard C.; and Pryor, Edward G., to Reliance Electric Company. Digital scale. 4,181,946, Cl. 364-466.000.
Loske, Hans: *See*—
Clamroth, Rudolf; Loske, Hans; and Schnetger, Jochen, 4,181,023, Cl. 73-432.00R.
Low, Martin: *See*—
Deutschlander, Gert; and Low, Martin, 4,181,213, Cl. 198-419.000.
Lubrizol Corporation, The: *See*—
Doggett, Roger H.; and Buccigross, Henry L., 4,181,557, Cl. 156-331.000.
Luchsinger, Charles R. Flexible dispenser for flexible sheets. 4,181,240, Cl. 221-39.000.
Luke, Douglas V.: *See*—
Baker, Peter D.; and Luke, Douglas V., 4,181,397, Cl. 350-96.200.
Lumen, Karl L. G., to Sandvik Aktiebolag. Rock drill bit with stress relief insert sockets. 4,181,187, Cl. 175-410.000.
Lummus Company, The: *See*—
Sze, Morgan C., 4,181,601, Cl. 208-143.000.
Lundberg, Bo E. O.; and Scuka, Viktor, to Telefonaktiebolaget L M Ericsson. Self-floating cable for marine operations. 4,181,815, Cl. 174-101.500.
Lundberg, Robert D.: *See*—
Brenner, Douglas; and Lundberg, Robert D., 4,181,780, Cl. 521-93.000.
Lutz, David W. Article handling apparatus. 4,181,460, Cl. 414-400.000.
Luwa AG: *See*—
Gruter, Johann, 4,181,608, Cl. 210-71.000.
Lyles, Herbert H. Combined chimney cover and damper. 4,181,119, Cl. 126-286.000.
Lyons, Francis T., to Union Carbide Corporation. Scanner data multiplexer for interfacing a radiation detector array and a computer. 4,181,939, Cl. 364-200.000.
Maahs, Gunther; Rombusch, Konrad; and Zaar, Wolfgang, to Chemische Werke Huels, Aktiengellschaft. Copolymerization of ethylene employing an organic chlorine compound-activated Ziegler-Natta catalyst. 4,181,790, Cl. 526-143.000.
Maass, Hans: *See*—
Eckhold, Gerd-Jurgen; and Maass, Hans, 4,181,002, Cl. 72-387.000.
Maatje, Henri: *See*—
Adler, Reinhard; and Maatje, Henri, 4,181,945, Cl. 364-436.000.
Maatschappij van Berkel's Patent N.V.: *See*—
Brendel, Albert E., 4,181,011, Cl. 73-141.00A.
Macedo, Pedro B.; Mohr, Robert K.; and Gupta, Prabhat K., to De Macedo, Pedro Buarque; and Litovits, Theodore Aaron. Optical fiber with compression surface layer. 4,181,403, Cl. 350-96.330.
Machinenfabrik Korfmann GmbH: *See*—
Weisner, Horst, 4,181,115, Cl. 125-21.000.
Maddock, Don G., to General Motors Corporation. Torque converter. 4,180,978, Cl. 60-345.000.
Machashi, Yukio, to Nippon Electric Co., Ltd. Noise-inhibiting circuit responsive to a signal supplied only to the first stage of the circuit. 4,181,861, Cl. 307-221.00C.
Maginot, Pierre; and Le Peutrec, Roger, to Alsthom-Atlantique. Device for preventing leakages of working fluid from a heat engine. 4,180,983, Cl. 60-657.000.
Mahieu, Jean-Rene: *See*—
Bouvard, Andre; and Mahieu, Jean-Rene, 4,181,905, Cl. 333-255.000.
Maier, Charles L., Jr. Procedure for the assay of pharmacologically immunologically and biochemically active compounds in biological fluids. 4,181,650, Cl. 260-112.700.
Maillard, Jacques G., to Laboratoires Jacques Logeais. Phenylacetic acid derivatives and therapeutic composition containing same. 4,181,736, Cl. 424-317.000.
Maitland, David S.: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.
Maitland, Roy, to Count Numbering Machine, Inc. Electro-mechanical marking device. 4,181,560, Cl. 156-542.000.
Makabe, Hachiro: *See*—
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, 4,181,086, Cl. 112-158.00F.
Makin, Earle C.; and Okamoto, K. Keith, to Monsanto Company. Process for methanol production. 4,181,675, Cl. 260-449.500.
Makushin, Mikhail P.: *See*—
Kononov, Ivan V.; Makushin, Mikhail P.; Polukhin, Dmitry I.; Popov, Vyacheslav E.; and Salov, Viktor P., 4,181,003, Cl. 72-441.000.
Malbec, Edouard. Peristaltic pump and a tube for said pump. 4,181,476, Cl. 417-477.000.
Maldavs, Ojars, to Gould, Inc. Lever-type quick disconnect coupling. 4,181,150, Cl. 137-614.060.
Malick, Emil A., to Phillips Petroleum Company. Fermentation method. 4,181,576, Cl. 435-247.000.
Malin, Leon: *See*—
Mittelman, Phillip S.; Malin, Leon; and Heyl, John K., 4,181,955, Cl. 364-521.000.
Malloy, John D., to General Motors Corporation. Control for a torque converter slipping clutch. 4,181,203, Cl. 192-3.300.
Malsot, Christian; and Roux, Marcel, to Socapex. Connector with positioning sleeves for a single optical fibre. 4,181,400, Cl. 350-96.210.
Mann, Rose A. Body positioner. 4,180,879, Cl. 5-508.000.
Mannella, Henry E.: *See*—
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.
Mantey, Patrick E.: *See*—
Casey, Richard G.; Langdon, Glen G., Jr.; Mantey, Patrick E.; and Williams, Robin, 4,181,952, Cl. 364-515.000.
Marcuse, Dietrich, to Bell Telephone Laboratories, Incorporated. Method for determining the refractive index profile of optical fibers and optical fiber preforms. 4,181,433, Cl. 356-73.100.
Marenin, George B., to International Business Machines Corporation. Microprocessor architecture with integrated interrupts and cycle steals prioritized channel. 4,181,934, Cl. 364-200.000.
Margetts, George; Andrews, Roderic S.; and Legros, Jean, to Sterling Drug Inc. Analgesic N-acetyl-para-aminophenyl N'-acetylaminothioalkanoates. 4,181,719, Cl. 424-233.000.
Marion, Thomas E., to Maryland Cup Corporation. Container having premium-containing-and-dispensing bottom structure and method and apparatus for providing same. 4,181,219, Cl. 206-217.000.
Markle, Charles R. Fault detecting apparatus for fluid pressure systems. 4,181,017, Cl. 73-168.000.
Marks, Ronald A.; and Dorius, John O. Hydropressure power. 4,180,980, Cl. 60-398.000.
Marley, John. System and method for speech recognition. 4,181,813, Cl. 179-1.0SE.
Martens, John A.; Clemens, Lawrence M.; and Zigman, Alvin R., to Minnesota Mining and Manufacturing Company. Acrylic-type pressure sensitive adhesives by means of ultraviolet radiation curing. 4,181,752, Cl. 427-54.100.
Martini, Leonard J., to United States of America, Navy. Multiple function CO_2 valve. 4,181,139, Cl. 137-68.00A.

Martor-Argentax E. H. Beermann K.G.: *See*—
Beermann, Ewald H., 4,180,908, Cl. 30-279.00R.
Marx, Karl-Heinz: *See*—
Schatz, Friedrich; Marx, Karl-Heinz; and Rohner, Peter, 4,181,543, Cl. 148-127.000.
Marx, Michael; and Kertesz, Denis J., to Syntex (U.S.A.) Inc. Corticosteroid antiinflammatory agents. 4,181,720, Cl. 424-241.000.
Maryland Cup Corporation: *See*—
Marion, Thomas E., 4,181,219, Cl. 206-217.000.
Masada, Keizi: *See*—
Murakami, Ryoichi; Anegawa, Yukio; Ishida, Minoru; and Masada, Keizi, 4,181,539, Cl. 148-6.15R.
Masanori, Uchidoi: *See*—
Sugiura, Yoji; Tezuka, Nobuo; Yoshikawa, Ryoichi; and Masanori, Uchidoi, 4,181,417, Cl. 354-152.000.
Mascher, Ludwig, Jr.: *See*—
Ellenberger, Willi; Blum, Holger; Muller-Zitzke, Harald; and Mascher, Ludwig, Jr., 4,181,651, Cl. 260-119.000.
Mason, Norbert S.; and Sparks, Robert E. Polyanion-stabilized aluminum hydrogels. 4,181,718, Cl. 424-180.000.
Mason, Richard C.; and Petronis, John D. Cardiotachometer. 4,181,134, Cl. 128-689.000.
Massachusetts Institute of Technology: *See*—
Goudey, Clifford A., 4,180,935, Cl. 43-9.000.
Swartz, Mitchell R., 4,181,128, Cl. 128-207.210.
Massey-Ferguson Inc.: *See*—
Old, John L., 4,181,181, Cl. 172-443.000.
Massey-Ferguson Services N.V.: *See*—
Pensa, Carlo, 4,180,981, Cl. 60-435.000.
Massey, James V., III: *See*—
Wardlaw, Stephen C.; Massey, James V., III; and Levine, Robert A., 4,181,609, Cl. 210-72.000.
Master Lock Company: *See*—
Lebrecht, Horst, 4,180,996, Cl. 70-52.000.
Masuda, Sadao: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.
Masuda, Takao: *See*—
Ikenoue, Shinpei; Sekikawa, Nobuyoshi; and Masuda, Takao, 4,181,530, Cl. 430-620.000.
Mathematical Applications Group, Inc.: *See*—
Mittelman, Phillip S.; Malin, Leon; and Heyl, John K., 4,181,955, Cl. 364-521.000.
Matousek, Jaroslav P.: *See*—
Smythe, Lloyd E.; and Matousek, Jaroslav P., 4,181,438, Cl. 356-312.000.
Matsko, Joseph J.; Lange, Emroy W.; and Skalka, Paul, to Westinghouse Electric Corp. Circuit interrupter with interlocked removable trip unit. 4,181,906, Cl. 335-6.000.
Matsko, Joseph J.; Shimp, Alan B.; and Skalka, Paul, to Westinghouse Electric Corp. Circuit interrupter with improved adjustable trip unit. 4,181,922, Cl. 361-115.000.
Matsuda, Hiroshi: *See*—
Wake, Junichi; and Matsuda, Hiroshi, 4,181,109, Cl. 123-119.00A.
Matsuda, Mutsuhide: *See*—
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Matsuoka, Saburo: *See*—
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,181,102, Cl. 123-75.00B.
Matsushiro, K.K.: *See*—
Matsushiro, Yukimitsu, 4,180,939, Cl. 46-75.000.
Matsushiro, Yukimitsu, to Matsushiro, K.K. Helicopter toy. 4,180,939, Cl. 46-75.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ichinohe, Eisuke, 4,181,537, Cl. 148-1.500.
Kohara, Rikusei; and Aoyama, Takashi, 4,181,406, Cl. 350-357.000.
Morisawa, Masanori, 4,181,866, Cl. 310-154.000.
Tatsumi, Toshio; Otani, Tadashi; and Yamazi, Masami, 4,181,923, Cl. 361-293.000.
Matsushita, Susumu; and Ikushige, Tetsuo, to Toyo Soda Manufacturing Co., Ltd. Method of separating peptides. 4,181,649, Cl. 260-112.50R.
Matsuyama, Takeshi: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,181,542, Cl. 148-187.000.
Mattern, Taylor F.: *See*—
Herring, Clarence R.; Mattern, Taylor F.; and Radcliffe, Curtis E., 4,181,367, Cl. 303-7.000.
Mattes, Gerd: *See*—
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.
May, Russell P. Razor with orbiting discs with sharp-edge slots, and method for making discs. 4,180,906, Cl. 30-42.000.
Mayer, Johann: *See*—
Klier, Hermann; Kellner, Gerd; and Mayer, Johann, 4,181,079, Cl. 102-56.0SC.
Mayer, William R.; and Rieth, Lawrence E., to Stewart-Warner Corporation. Tire deflation monitor. 4,181,831, Cl. 200-61.250.
Mayrl, Jose A. Slip-cased core-forming mandrel. 4,181,696, Cl. 264-166.000.
McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Isolation of HB_2Ag. 4,181,713, Cl. 424-86.000.
McAllister, Gary L., to Jersey Nuclear-Avco Isotopes, Inc. Controlled frequency high power laser. 4,181,898, Cl. 331-94.50S.
McCall, John M., to Upjohn Company, The. Isochroman. 4,181,665, Cl. 260-340.50R.
McCarthy, Jeremiah B.: *See*—
Popper, Felix B.; McCarthy, Jeremiah B.; and Hart, James R., 4,181,672, Cl. 260-429.00J.
McCarthy, Neil J., Jr.: *See*—
Ward, Robert J.; Kawakami, James H.; and McCarthy, Neil J., Jr., 4,181,687, Cl. 525-100.000.
McCarthy, Richard H., to FMC Corporation. Spring actuated, solenoid released brake mechanism. 4,181,201, Cl. 188-171.000.
McCoy, Michael R., to Electronic Arrays, Inc. Acquisition and storage of analog signals. 4,181,980, Cl. 365-45.000.
McDonnell Douglas Corporation: *See*—
Smith, Hugh D.; and Blackmore, David M., 4,180,943, Cl. 49-279.000.
McFall, Andrew J., to Du Pont de Nemours, E. I., and Company. Yarn-handling device. 4,181,247, Cl. 226-97.000.
McGee, John K.; Bridges, Charles D.; and Brown, Robert T., to Combustion Engineering, Inc. Control line exiting coupling. 4,181,175, Cl. 166-85.000.
McGee, Paul D.: *See*—
DeLamoreaux, Murray I.; and McGee, Paul D., 4,181,823, Cl. 179-100.110.
McKinney, Ray, Jr.: *See*—
Carden, Joseph A., Jr.; and McKinney, Ray, Jr., 4,181,606, Cl. 210-22.00A.
McKinzie, Howard; and Trickett, Elizabeth A., to GTE Laboratories Incorporated. Modified titanium dioxide photoactive electrodes. 4,181,593, Cl. 204-290.00F.
McKinzie, Howard; and Trickett, Elizabeth A., to GTE Laboratories Incorporated. In situ method of preparing modified titanium dioxide photoactive electrodes. 4,181,754, Cl. 427-74.000.
McLaughlin, Thomas P., to Stouffer Corporation, The. Adjustable spacers for flat plate food freezers. 4,180,987, Cl. 62-341.000.
McMahon, Donald H.; and Nelson, Arthur R., to Sperry Rand Corporation. Optical internal reflectance switchable coupler. 4,181,399, Cl. 350-96.140.
McMasters, Walter E. Gravity actuated toy device. 4,180,940, Cl. 46-216.000.
McNeil Corporation: *See*—
Kitchen, Clarence E.; and Wegmann, Jerome B., 4,181,066, Cl. 91-306.000.
McOnie, Malcolm P.; Roberts, Philip D.; Rose, John B.; and Englin, Boris, to ICI Australia Limited. Vinyl halide polymerization process and reactor therefor. 4,181,787, Cl. 526-62.000.
McPhee, Charles J., to American Hospital Supply Corporation. Solvent-bonded joint and method of making the same. 4,181,549, Cl. 156-146.000.
McQuay-Perflex, Inc.: *See*—
Osheroff, Gene W., 4,181,153, Cl. 137-838.000.
McSherry, Thomas W., to Mechanical Plastics Corporation. Fastening element. 4,181,061, Cl. 85-80.000.
Mecca, Sebastian B., to Carroll Products, Inc. Allantoin urocanic acid complexes. 4,181,804, Cl. 548-311.000.
Mechanical Plastics Corporation: *See*—
McSherry, Thomas W., 4,181,061, Cl. 85-80.000.
Medical Devices, Inc.: *See*—
Schwoboda, George F.; and Wingrove, Robert C., 4,181,121, Cl. 128-762.000.
Meiji Seika Kaisha Ltd.: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.
Meltzer, Robert J., to American Optical Corporation. Color compensation system for Abbe refractometer. 4,181,434, Cl. 356-137.000.
Meniconi, Alberto. Headstock for a panel cutting machine. 4,181,164, Cl. 144-3.00R.
Mennucci, Donald F.; and Auman, John T., to General Motors Corporation. Viscous fluid coupling. 4,181,205, Cl. 192-58.00B.
Menzel, Helmut: *See*—
Neuser, Johannes; and Menzel, Helmut, 4,181,838, Cl. 200-153.0LA.
Mercer, Lloyd I., Sr.; and Hugg, Steven B. Speed control device for trains. 4,181,943, Cl. 364-426.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; and Firestone, Raymond A., 4,181,733, Cl. 424-274.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,181,727, Cl. 424-270.000.
McAleer, William J.; and Wasmuth, Edward H., 4,181,713, Cl. 424-86.000.
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,181,661, Cl. 548-195.000.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,181,625, Cl. 252-299.000.
Merrill, Arthur A. Assembling method. 4,181,327, Cl. 281-25.00R.
Merten, Rudolf: *See*—
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,181,789, Cl. 528-73.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Klier, Hermann; Kellner, Gerd; and Mayer, Johann, 4,181,079, Cl. 102-56.0SC.
Miller, Luitpold, 4,181,080, Cl. 104-148.0MS.
Moelter, Gunther; Mueller, Hermann; and Kunz, Ruediger, 4,181,275, Cl. 244-213.000.

Met-L-Parts, Inc.: *See*—
Funk, Charles F., 4,181,342, Cl. 294-75.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Reuter, Gerhard; and Schnabel, Wolfram, 4,181,520, Cl. 75-36.000.

Metco, Inc.: *See*—
Novinski, Edward R., 4,181,525, Cl. 75-255.000.

Mewissen, Jan A. C.; and Van Beek, Ferdinandus M. J., to U.S. Philips Corporation. Lamp reflector unit. 4,181,930, Cl. 362-296.000.

Meyer, Arnfried. Pressing apparatus for squeezing laundry and the like. 4,180,995, Cl. 68-242.000.

Michels, Charles E., to Reliance Electric Company. Wrapping apparatus. 4,180,962, Cl. 53-556.000.

MicroVue Products Inc.: *See*—
Hall, Peter J., 4,181,404, Cl. 350-125.000.

Mihaescu, Constantin: *See*—
Moraru, Dinu S.; Tetcu, Ion; and Mihaescu, Constantin, 4,180,953, Cl. 52-169.140.

Mikosinski, Ronald M. Method of assembling a fastener. 4,180,899, Cl. 29-512.000.

Milchem Incorporated: *See*—
Elrod, Stephen H.; and Nance, Weldon B., 4,181,617, Cl. 252-8.50C.

Miles Laboratories, Inc.: *See*—
Havera, Herbert J.; Vidrio, Horacio; and Johnson, Richard D., 4,181,657, Cl. 424-256.000.

Millard, Irving I. Animated plant display. 4,180,932, Cl. 40-455.000.

Miller, Aaron, Jr.: *See*—
Leak, John; and Miller, Aaron, Jr., 4,181,024, Cl. 73-660.000.

Miller, Coleman J., to Westinghouse Electric Corp. High power molecular gas laser. 4,181,897, Cl. 331-94.50G.

Miller, Luitpold, to Messerschmitt-Bolkow-Blohm GmbH. Support structure for a magnetically levitated vehicle. 4,181,080, Cl. 104-148.0MS.

Miller, Roy W., to Pullman Incorporated. Hopper car cam lock door operating mechanism. 4,181,336, Cl. 292-262.000.

Miller, Stanley J.: *See*—
Jensen, James W.; and Miller, Stanley J., 4,181,015, Cl. 73-159.000.

Miller, Stephen J.; and Hughes, Thomas R., to Chevron Research Company. Naphtha processing including reforming, isomerization and cracking over a ZSM-5-type catalyst. 4,181,599, Cl. 208-79.000.

Millet, Marcus J., to Johnson & Johnson. Self-packaged medical device with frangible seal. 4,181,223, Cl. 206-365.000.

Milsco Manufacturing Company: *See*—
Swenson, Richard F.; Eimen, Shawn H.; Gryga, John J., Jr.; and Schommer, Gerard E., 4,181,357, Cl. 297-353.000.

Minatono, Shobu: *See*—
Takamatsu, Hideo; Minatono, Shobu; Terao, Katsuyoshi; and Yamauchi, Junnosuke, 4,181,635, Cl. 260-5.000.

Minemoto, Isao: *See*—
Takeuchi, Mitsuharu; Hayashi, Satoshi; and Minemoto, Isao, 4,180,913, Cl. 433-228.000.

Minnesota Mining and Manufacturing Company: *See*—
Martens, John A.; Clemens, Lawrence M.; and Zigman, Alvin R., 4,181,752, Cl. 427-54.100.
Schultz, Thomas E., Jr., 4,180,929, Cl. 40-2.200.
Weiher, Richard L.; Voll, Gerhard W.; and Hagemark, Kjell I., 4,181,627, Cl. 252-301.60R.
Williams, Brian H.; and Zollinger, J. Lamar, 4,181,766, Cl. 428-216.000.

Miracle, William C., to Square D Company. Circuit breaker with exterior insulating boot. 4,181,836, Cl. 200-144.00R.

Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, to Kikagaku Kenkyusho; and Ajinomoto. Antibiotics Bacileucines A and B and process for production and use thereof. 4,181,714, Cl. 424-117.000.

MistO_2Gen Equipment Company: *See*—
Cameto, Leon R.; and Edmund, John R., 4,181,129, Cl. 128-205.260.

Mita Industrial Co., Ltd.: *See*—
Okada, Tetuya; Umeda, Tadashi; Murakami, Masahiro; and Aizawa, Tatsuo, 4,181,424, Cl. 355-8.000.

Mitchell, Clarence I., to General Motors Corporation. Two-way check valve. 4,181,145, Cl. 137-493.800.

MITEC-Moderne Industrietechnik GmbH: *See*—
Chaborski, Hoiko, 4,181,431, Cl. 356-5.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Tanabe, Tomio; and Nishiwaki, Muneo, 4,181,197, Cl. 187-29.00R.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Tsuji, Jiro, 4,181,683, Cl. 260-593.00R.

Mitsubishi Rayon Co., Ltd.: *See*—
Iwata, Hiroshi; Ohtani, Takeiji; Arakawa, Seiichi; and Deguchi, Seiji, 4,181,581, Cl. 260-42.480.
Onishi, Hisao; Numazawa, Ryozo; and Takeda, Hitoshi, 4,181,604, Cl. 210-8.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kinoshita, Tatsuo, 4,181,645, Cl. 260-42.280.

Mitsui Polychemicals Co., Ltd.: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Toyoda, Yoshiaki; Teraji, Yoshiaki; and Suzuki, Takaai, 4,181,489, Cl. 431-11.000.

Mittelman, Phillip S.; Malin, Leon; and Heyl, John K., to Mathematical Applications Group, Inc. Apparatus for producing photographic slides. 4,181,955, Cl. 364-521.000.

Miyaka, Kenji; and Noro, Hisao, to Citizen Watch Company Limited. Process for forming electrode pattern on electro-optical display device. 4,181,563, Cl. 156-643.000.

Miyakawa, Nobuaki: *See*—
Yamauchi, Teruo; Oyama, Yoshishige; and Miyakawa, Nobuaki, 4,181,944, Cl. 364-431.000.

Miyata, Sinji, to Hashimoto Denki Co., Ltd. Apparatus for automatically cutting sheet material. 4,181,055, Cl. 83-350.000.

Miyoshi, Katsuhiko, to Tokyo Shibaura Electric Co., Ltd. X-ray apparatus for a computed tomography scanner. 4,181,857, Cl. 250-402.000.

Mobil Oil Corporation: *See*—
Chester, Arthur W., 4,181,600, Cl. 208-113.000.
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,181,598, Cl. 208-58.000.
Savins, Joseph G., 4,181,178, Cl. 166-274.000.
Schmitt, Robert H.; and Poole, Ronald J., 4,181,619, Cl. 252-32.500.
Yan, Tsoung-Yuan; and Bridger, Robert F., 4,181,597, Cl. 208-46.000.
Young, Lewis B., 4,181,811, Cl. 585-486.000.

Moedritzer, Kurt, to Monsanto Company. Phosphorus-containing flame retardant compositions. 4,181,646, Cl. 260-45.70P.

Moelter, Gunther; Mueller, Hermann; and Kunz, Ruediger, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for operating flap means secured to the wing of an aircraft. 4,181,275, Cl. 244-213.000.

Mohawk Data Sciences Corp.: *See*—
Benysek, Bruce M., 4,181,933, Cl. 364-200.000.

Mohr, Robert K.: *See*—
Macedo, Pedro B.; Mohr, Robert K.; and Gupta, Prabhat K., 4,181,403, Cl. 350-96.330.

Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., to Bayer Aktiengesellschaft. Preparation of polyisocyanates having biuret groups and their use in synthetic foamed resins and lacquers. 4,181,782, Cl. 521-162.000.

Moisan, Jean-Claude, to Di Palma Irrigation S.A. Self-propelling watering apparatus. 4,181,257, Cl. 239-183.000.

Moldex, Inc.: *See*—
Paine, Ellis H., 4,181,550, Cl. 156-164.000.

Molins, Ltd.: *See*—
Hinchcliffe, Dennis, 4,181,212, Cl. 198-419.000.

Monsanto Company: *See*—
Carden, Joseph A., Jr.; and McKinney, Ray, Jr., 4,181,606, Cl. 210-22.00A.
Makin, Earle C.; and Okamoto, K. Keith, 4,181,675, Cl. 260-449.500.
Moedritzer, Kurt, 4,181,646, Cl. 260-45.70P.

Mooney, Robert A. Vehicular jack. 4,181,463, Cl. 414-490.000.

Moore, David M., to Armstrong Store Fixtures Corporation. Resilient partition for use with perforated shelving. 4,181,229, Cl. 211-184.000.

Moore, George J.: *See*—
Evers, Robert C.; and Moore, George J., 4,181,681, Cl. 260-575.000.

Moore, James H.; and Lee, Gene D., to Texas Instruments Incorporated. Integrated electronics assembly on a plastic chassis. 4,181,964, Cl. 364-708.000.

Moore, John F., to EMI Limited. Adjustable compensating device for radiographic apparatus. 4,181,858, Cl. 250-445.00T.

Moraru, Dinu S.; Tetcu, Ion; and Mihaescu, Constantin. Method and apparatus for countering an upward capillary flow of soil moisture in a foundation wall. 4,180,953, Cl. 52-169.140.

Moreau, Richard A.: *See*—
Knape, Richard S.; and Moreau, Richard A., 4,181,010, Cl. 73-119.00A.

Moretto, Jose P. Theatre lighting control system. 4,181,844, Cl. 307-157.000.

Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Fibers, filter rods and other nonwoven articles made from poly(1,2-propylene terephthalate) copolyesters of terephthalic acid, 1,2-propylene glycol and ethylene glycol. 4,181,640, Cl. 260-30.40R.

Morimoto, Ryoichi: *See*—
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, 4,181,228, Cl. 209-552.000.

Morisawa, Masanori, to Matsushita Electric Industrial Co., Ltd. Permanent magnet with reduced thickness at the pole areas for small size d-c motors. 4,181,866, Cl. 310-154.000.

Morita, Akira: *See*—
Yamane, Kimitaka; Morita, Akira; and Ueno, Zene, 4,181,100, Cl. 123-32.0ST.

Morita, Eiichi; and Kanai, Takeo, to Eisai Co., Ltd. Propiophenone derivatives and preparation thereof. 4,181,803, Cl. 546-237.000.

Morlock, Gerhard: *See*—
Holle, Hans-Joachem; and Morlock, Gerhard, 4,181,642, Cl. 260-37.0EP.

Moroishi, Yutaka: *See*—
Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, 4,181,786, Cl. 525-327.000.

Morris, Donald E.: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.

Morris, John C.: *See*—
Jackson, Winston J., Jr.; and Morris, John C., 4,181,792, Cl. 528-190.000.

Morrissey, George F., Jr.; and Wright, Lawrence A., to Paceco Division of Fruehauf Corporation. Polar wye crane. 4,181,231, Cl. 212-21.000.

Mortimer, Ivan, to Girling Limited. Modulator for anti-skid vehicle braking systems. 4,181,372, Cl. 303-115.000.

Morton, Douglas R., Jr., to Upjohn Company, The. Methylenecyclopentane derivatives. 4,181,798, Cl. 542-426.000.

Morton, Kim L.: *See*—
Beckenbaugh, William M.; Goldman, Patricia J.; and Morton, Kim L., 4,181,750, Cl. 430-414.000.

Morton-Norwich Products, Inc.: *See*—
White, Ralph L., Jr., 4,181,799, Cl. 544-48.000.

Moser, Karl: *See*—
Forgo, Gabor; and Moser, Karl, 4,181,422, Cl. 355-3.0DD.

Moser, Peter: *See*—
Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, 4,181,499, Cl. 8-26.000.

Motorola, Inc.: *See*—
DeLamoreaux, Murray I.; and McGee, Paul D., 4,181,823, Cl. 179-100.110.
DeSantis, John A.; and Gottlieb, Ellis J., 4,181,385, Cl. 339-17.00C.
Ehmke, Edward L., 4,181,893, Cl. 325-492.000.
Latasiewicz, Leonard, 4,181,826, Cl. 200-340.000.
Nash, Harold G.; and Linford, John R., 4,181,967, Cl. 364-724.000.

Motter, Manfred: *See*—
Koller, Joseph; Motter, Manfred; Moser, Peter; Horn, Ulrich; and Galafassi, Pierre, 4,181,499, Cl. 8-26.000.

Mueller, Hermann: *See*—
Moelter, Gunther; Mueller, Hermann; and Kunz, Ruediger, 4,181,275, Cl. 244-213.000.

Mukunoki, Yasuo: *See*—
Toda, Yuzo; Mukunoki, Yasuo; and Koizumi, Junji, 4,181,527, Cl. 430-543.000.

Müller, Hanns P.: *See*—
Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,181,782, Cl. 521-162.000.

Muller, Helmut: *See*—
Haller, Karl-Heinz; and Muller, Helmut, 4,181,445, Cl. 400-632.100.

Muller, Rolf, to Papst-Motoren KG. Brushless direct-current motor. 4,181,867, Cl. 310-156.000.

Muller, Thomas P., to Caterpillar Tractor Co. Door holding apparatus. 4,181,337, Cl. 292-271.000.

Muller-Zitzke, Harald: *See*—
Ellenberger, Willi; Blum, Holger; Muller-Zitzke, Harald; and Mascher, Ludwig, Jr., 4,181,651, Cl. 260-119.000.

Mummert, Harold B. Solar heating system. 4,181,118, Cl. 126-429.000.

Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, to Nitto Electric Industrial Co., Ltd. Antibacterial and antifungal material. 4,181,786, Cl. 525-327.000.

Murakami, Masahiro: *See*—
Okada, Tetuya; Umeda, Tadashi; Murakami, Masahiro; and Aizawa, Tatsuo, 4,181,424, Cl. 355-8.000.

Murakami, Ryoichi; Anegawa, Yukio; Ishida, Minoru; and Masada, Keizi, to Nippon Paint Co., Ltd. Process of phosphating an iron substrate in a closed system using aromatic nitro compound accelerators. 4,181,539, Cl. 148-6.15R.

Murari, Bruno; and Coccetti, Silvano, to SGS-ATES Component Elettronici S.p.A. Integrated-circuit chip with voltage divider. 4,181,878, Cl. 323-94.00R.

Murphy, Clarence R.: *See*—
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,181,794, Cl. 528-496.000.

Murphy, Desmond L.: *See*—
Holland, Kenneth C.; Reed, Gary W.; and Murphy, Desmond L., 4,181,903, Cl. 333-81.00R.

Musser, Harry R., to Eastman Kodak Company. Poly(hydrazonehydrazine). 4,181,793, Cl. 528-327.000.

Naef, Emil, to Baumann, Walter. Differential roll pull-out system. 4,181,383, Cl. 312-334.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Sprocket for bicycles. 4,181,033, Cl. 74-243.00R.

Nagase, Toshiro, to Tokico Ltd. Door closer. 4,180,888, Cl. 16-58.000.

Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, to Idemitsu Kosan Company, Ltd. Resin compositions containing modified polypropylene. 4,181,689, Cl. 525-419.000.

Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece with global time zone display. 4,180,969, Cl. 58-42.500.

Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, to Bristol-Myers Company. 1-N-(ω-amino-α-hydroxyalkanoyl) derivatives of 4'-deoxy-6'-N-methylkanamycin A. 4,181,797, Cl. 536-10.000.

Nakada, Masahiko: *See*—
Sanada, Masakatsu; and Nakada, Masahiko, 4,181,111, Cl. 123-133.000.

Nakagawa, Akira: *See*—
Ohashi, Nozomu; Yamamuro, Okimasa; Asakura, Takasuke; and Nakagawa, Akira, 4,181,711, Cl. 428-40.000.

Nakagawa, Susumu: *See*—
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 4,181,797, Cl. 536-10.000.

Nakagawa, Tamotsu: *See*—
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, 4,181,086, Cl. 112-158.00F.

Nakaguti, Osamu: *See*—
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.

Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.

Nakamachi, Hideo: *See*—
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, 4,181,610, Cl. 210-85.000.

Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, to Honshu Seishi Kabushiki Kaisha. Process for cooking lignocellulosic material in the presence of hydroxyanthracenes and derivatives thereof. 4,181,565, Cl. 162-76.000.

Nakamura, Zenzo: *See*—
Ohtaki, Syohei; Kondo, Keiko; Nakamura, Zenzo; and Okuno, Youichi, 4,181,416, Cl. 354-106.000.

Nakao, Tadaichi: *See*—
Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, 4,181,786, Cl. 525-327.000.

Nakashima, Kunimichi: *See*—
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.

Nakatsukasa, Susumu: *See*—
Sano, Tsutomu; Takeuchi, Naoki; Kurumaji, Masanobu; and Nakatsukasa, Susumu, 4,181,510, Cl. 55-183.000.

Nakayama, Yoshinori: *See*—
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.

Nance, Weldon B.: *See*—
Elrod, Stephen H.; and Nance, Weldon B., 4,181,617, Cl. 252-8.50C.

Narayan, Jagdish; White, Clark W.; and Young, Rosa T., to United States of America, Energy. Method for making defect-free zone by laser-annealing of doped silicon. 4,181,538, Cl. 148-1.500.

Nardi, Anthony P.: *See*—
Kent, William H.; and Nardi, Anthony P., 4,181,468, Cl. 417-63.000.

Nash, Dudley O., to General Electric Company. Hydraulic actuation ring. 4,181,260, Cl. 239-265.390.

Nash, Harold G.; and Linford, John R., to Motorola, Inc. Digital apparatus approximating multiplication of analog signal by sine wave signal and method. 4,181,967, Cl. 364-724.000.

National Blank Book Company, Inc.: *See*—
St. Amand, Robert, 4,181,381, Cl. 312-183.000.

National Drying Machinery Co.: *See*—
Carpenter, William T., 4,181,215, Cl. 198-483.000.

National Research Development Corporation: *See*—
Currah, Ian E., 4,181,241, Cl. 221-211.000.

National Semiconductor Corporation: *See*—
Rich, Dennis E., 4,181,554, Cl. 156-261.000.

NCR Corporation: *See*—
Hanson, Duane E.; and Bartels, Philip R., 4,181,771, Cl. 428-327.000.
Phillips, Grover G., Jr., 4,181,919, Cl. 360-42.000.

Nejedly, Josef: *See*—
Bajek, Frantisek; and Nejedly, Josef, 4,181,084, Cl. 112-71.000.
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,181,083, Cl. 112-67.000.

Nelboeck-Hochstetter, Michael: *See*—
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, 4,181,575, Cl. 435-11.000.

Nelson, Arthur R.: *See*—
McMahon, Donald H.; and Nelson, Arthur R., 4,181,399, Cl. 350-96.140.

Neu, Francis, to S.A. Delta Neu. Ventilation and air conditioning unit. 4,181,690, Cl. 261-29.000.

Neubeck, Clifford E., to Rohm and Haas Company. Process for freeze-drying enzymes. 4,180,917, Cl. 34-5.000.

Neubronner, Rolf. Method and device for the tape-sealing of panels of paper, cardboard, plastic, or wood, and adhesive tape therefor. 4,181,558, Cl. 156-355.000.

Neuhierl, Hermann. Flight control system for free flight model aeroplanes. 4,181,830, Cl. 200-35.00H.

Neumann, Joachim, to Volkswagenwerk Aktiengesellschaft. Flexible pipe connection. 4,181,332, Cl. 285-334.400.

Neuser, Johannes; and Menzel, Helmut, to Hundt & Weber Schalgerate GmbH. Actuating mechanism with an auxiliary switch for an electrically lockable power switch. 4,181,838, Cl. 200-153.0LA.

Newland, Michael D.: *See*—
Bumpus, Gary, 4,181,352, Cl. 297-3.000.

Newman, Alec T.; and Rhodes, David, to General Foods Limited. Vending apparatus. 4,181,162, Cl. 141-105.000.

Newton, Roger F.; Roberts, Stanley M.; Rainey, David K.; and Dimsdale, Michael J., to Allen & Hanburys Limited. 5-Endo-protected hydroxyl-bicyclo[2,2,1]-heptan-2-ones and process for preparing same. 4,181,674, Cl. 260-448.80R.

Niagara Cutter Inc.: *See*—
Oaks, Ronald R., 4,181,456, Cl. 407-38.000.

Nichols, Thomas K. Positioning device for human limbs and the like. 4,181,297, Cl. 269-328.000.

Nicks, Larry J.: *See*—
Baglin, Elizabeth G.; Atkinson, Gary B.; and Nicks, Larry J., 4,181,630, Cl. 252-476.000.
Nicoloff, Nicholas, to United States of America, Navy. Control manifold. 4,181,152, Cl. 137-637.100.
Nidola, Antonio: *See*—
Spaziante, Placido M.; and Nidola, Antonio, 4,181,777, Cl. 429-50.000.
Niemann, Ernst-Georg; and Georgi, Bernd, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen; and Umweltforschung mbH. Apparatus for determining amino acids. 4,181,442, Cl. 356-417.000.
Niida, Taro: *See*—
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.
Nijman, John P., to Bunker Ramo Corporation. Field termination tool having a removable connector mounting mechanism and an insertion control mechanism. 4,180,904, Cl. 29-749.000.
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, to Snow Band Milk Products Co., Ltd. Process for producing surimi. 4,181,749, Cl. 426-643.000.
Nippon Electric Co., Ltd.: *See*—
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; and Kouyama, Toshitake. 4,181,914, Cl. 358-1.000.
Maehashi, Yukio, 4,181,861, Cl. 307-221.00C.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,181,542, Cl. 148-187.000.
Nippon Paint Co., Ltd.: *See*—
Murakami, Ryoichi; Anegawa, Yukio; Ishida, Minoru; and Masada, Keizi, 4,181,539, Cl. 148-6.15R.
Nippon Pneumatic Manufacturing Co., Ltd.: *See*—
Okada, Hiroshi, 4,181,183, Cl. 173-119.000.
Nippon Soken, Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,181,110, Cl. 123-119.00A.
Nippon Steel Corporation: *See*—
Kitayama, Minoru; Saito, Takao; and Wake, Ryousuke, 4,181,580, Cl. 204-28.000.
Nippon Suisan Kabushiki Kaisha: *See*—
Santo, Yoshiji, 4,181,739, Cl. 426-272.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Izumi, Kazuto; and Izumi, Kazuo, 4,181,970, Cl. 364-760.000.
Nippondenso Co., Ltd.: *See*—
Ina, Yoshifumi, 4,181,473, Cl. 417-365.000.
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,181,884, Cl. 324-208.000.
Nishikawa, Masao: *See*—
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, 4,181,610, Cl. 210-85.000.
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, to Toyoda-Koki Kabushiki-Kaisha. Pallet exchange apparatus for machine tool. 4,181,211, Cl. 198-339.000.
Nishimura, Taiichi: *See*—
Satomura, Masato; Kiritani, Masataka; and Nishimura, Taiichi, 4,181,328, Cl. 282-27.500.
Nishiwaki, Muneo: *See*—
Tanabe, Tomio; and Nishiwaki, Muneo, 4,181,197, Cl. 187-29.00R.
Nissan Diesel Kogyo Company, Ltd.: *See*—
Wake, Junichi; and Matsuda, Hiroshi, 4,181,109, Cl. 123-119.00A.
Nissan Motor Company, Limited: *See*—
Takagi, Yasuo; and Katoh, Kazumasa, 4,180,975, Cl. 60-290.000.
Yamane, Kimitaka; Morita, Akira; and Ueno, Zene, 4,181,100, Cl. 123-32.0ST.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Disposable cigaret lighter with snuffing cover. 4,181,490, Cl. 431-129.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, 4,181,786, Cl. 525-327.000.
Ohashi, Nozomu; Yamamuro, Okimasa; Asakura, Takasuke; and Nakagawa, Akira, 4,181,711, Cl. 428-40.000.
Nix, Edwin L.; and Davenport, Bobby E. Truck bed liner. 4,181,349, Cl. 296-39.00R.
Noeami, Tomoyuki; and Hayashi, Hideyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for vehicle braking systems. 4,181,370, Cl. 303-24.00F.
Nogami, Tomoyuki: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,181,147, Cl. 137-572.000.
Nohira, Hidetaka: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,181,110, Cl. 123-119.00A.
Nolden, Kurt, to Koppers Company, Inc. Process for treatment of residual gas. 4,181,507, Cl. 55-73.000.
Nolden, Werner, to American Standard Inc. Thermostatically controlled mixing valve for sanitary devices. 4,181,252, Cl. 236-12.00R.
Noller, Hans G., to G. D. Searle & Co. Internal reflectance spectrometer. 4,181,441, Cl. 356-414.000.
Nomura, Kenji: *See*—
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.
Nomura, Toshio; and Shishido, Toshimasa, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor choke valve controlling device. 4,181,107, Cl. 123-119.00F.
Nomura, Yoshika: *See*—
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, 4,181,565, Cl. 162-76.000.
Nopper, Peter, to Zumbach Electronic AG. Process for the measurement of absolute values by means of a non-linearly working measured value emitter, and a measuring device for carrying out the process. 4,181,961, Cl. 364-563.000.
Noranda Mines Limited: *See*—
Kitzinger, Frank, 4,181,699, Cl. 422-87.000.
Nordson Corporation: *See*—
Crum, Gerald, 4,181,261, Cl. 239-288.500.
Noro, Hisao: *See*—
Miyaka, Kenji; and Noro, Hisao, 4,181,563, Cl. 156-643.000.
Norris, Gilbert H. Closure for a collapsible tube. 4,181,246, Cl. 222-548.000.
Northrop Corporation: *See*—
Gerhardt, Heinz A., 4,181,277, Cl. 244-218.000.
Hitterdal, Allan B., 4,181,910, Cl. 343-18.00E.
Northrup, Incorporated: *See*—
Northrup, Lynn L., Jr., 4,180,985, Cl. 62-94.000.
Northrup, Lynn L., Jr., to Northrup, Incorporated. Air conditioning system with regeneratable desiccant bed. 4,180,985, Cl. 62-94.000.
Norton, Ralph L. Flange turning tool. 4,181,048, Cl. 81-90.00C.
Novinski, Edward R., to Metco, Inc. Self-bonding flame spray powders for producing readily machinable coatings. 4,181,525, Cl. 75-255.000.
NSK-Warner K.K.: *See*—
Ueda, Takeo, 4,181,832, Cl. 200-61.58B.
Numazawa, Ryozo: *See*—
Onishi, Hisao; Numazawa, Ryozo; and Takeda, Hitoshi, 4,181,604, Cl. 210-8.000.
Nuver, Eric L. H., to Esquire, Inc. High frequency dimmer circuit for high intensity, gaseous discharge lamp. 4,181,873, Cl. 315-291.000.
N.V. Raychem S.A.: *See*—
Corke, Nicholas T., 4,181,775, Cl. 428-348.000.
Oakes, Vincent: *See*—
Burley, Joseph W.; Hutton, Ronald E.; and Oakes, Vincent, 4,181,671, Cl. 260-410.600.
Oaks, Ronald R., to Niagara Cutter Inc. Cutting tool. 4,181,456, Cl. 407-38.000.
Obayashi, Hideki: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,181,110, Cl. 123-119.00A.
Occidental Oil Shale, Inc.: *See*—
Burton, Robert S., III, 4,181,362, Cl. 299-2.000.
Ridley, Richard D.; and Burton, Robert S., III, 4,181,361, Cl. 299-2.000.
Occidental Research Corporation: *See*—
Compton, Leslie E., 4,181,177, Cl. 166-256.000.
Oelke, Erwin S., to Smith International, Inc. Rock bit having an improved cone retention system. 4,181,377, Cl. 308-8.200.
Ogawa, Minoru, to Quigley Company, Inc. Sprayer for repairing refractory lining. 4,181,258, Cl. 239-186.000.
Ogino, Shigeo: *See*—
Yoshida, Noboru; Kiyohara, Takao; and Ogino, Shigeo, 4,181,731, Cl. 424-273.00R.
Ogiu, Hisao, to Olympus Optical Co., Ltd. High frequency electrosurgical instrument for cutting human body cavity structures. 4,181,131, Cl. 128-303.150.
Ogorek, Kurt: *See*—
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, 4,181,363, Cl. 299-17.000.
Ohashi, Nozomu; Yamamuro, Okimasa; Asakura, Takasuke; and Nakagawa, Akira, to Nitto Electric Industrial Co., Ltd. Sealing material. 4,181,711, Cl. 428-40.000.
Ohkoshi, Fumihiko: *See*—
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.
Ohmi, Atsushi: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,181,147, Cl. 137-572.000.
Ohta, Takaaki: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,181,147, Cl. 137-572.000.
Ohtaki, Syohei; Kondo, Keiko; Nakamura, Zenzo; and Okuno, Youichi, to Canon Kabushiki Kaisha. Data printer for a camera. 4,181,416, Cl. 354-106.000.
Ohtani, Takeiji: *See*—
Iwata, Hiroshi; Ohtani, Takeiji; Arakawa, Seiichi; and Deguchi, Seiji, 4,181,581, Cl. 260-42.480.
Okada, Hiroshi, to Nippon Pneumatic Manufacturing Co., Ltd. Impact tool. 4,181,183, Cl. 173-119.000.
Okada, Tetuya; Umeda, Tadashi; Murakami, Masahiro; and Aizawa, Tatsuo, to Mita Industrial Co., Ltd. Method of and means for synchronously transferring original and copying paper for electrostatic photoduplication. 4,181,424, Cl. 355-8.000.
Okada, Yoneo: *See*—
Kogure, Yasuyuki; and Okada, Yoneo, 4,181,276, Cl. 244-215.000.
Okamoto, K. Keith: *See*—
Makin, Earle C.; and Okamoto, K. Keith, 4,181,675, Cl. 260-449.500.
Okamura, Masatoshi: *See*—
Shiba, Haruo; and Okamura, Masatoshi, 4,181,272, Cl. 242-74.100.

Oku, Teruo: *See*—
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.

Okuno, Youichi: *See*—
Ohtaki, Syohei; Kondo, Keiko; Nakamura, Zenzo; and Okuno, Youichi, 4,181,416, Cl. 354-106.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including program trace means. 4,181,965, Cl. 364-710.000.

Olashaw, William F., to General Electric Company. Aluminum-copper electrical joint. 4,181,396, Cl. 339-263.00R.

Old, John L., to Massey-Ferguson Inc. Tractor implement hitch with rubbing surfaces to limit sway. 4,181,181, Cl. 172-443.000.

Oldham, Walter, to Beaufort (Air-Sea) Equipment Limited. Buoyancy aid. 4,180,883, Cl. 9-312.000.

Oley, Leonard; and Stachnik, Joseph, to ARA Services, Inc. Deflector valve for fluids. 4,181,154, Cl. 137-863.000.

Olin Corporation: *See*—
Chandalia, Kiran B.; Preston, Frank J.; and Barnowski, Henry G., 4,181,781, Cl. 521-137.000.

Oliver, George D.; Eisenhoffer, Joseph T.; and Eisenhoffer, Joseph H. Cassette holder. 4,181,282, Cl. 248-448.000.

Olschewski, Armin: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,181,374, Cl. 308-6.00C.
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.

Olson, Richard M.: *See*—
Chwalek, Vincent P.; and Olson, Richard M., 4,181,748, Cl. 426-623.000.

Olsson, Billy E., to AMP Incorporated. Zero insertion force connector clip. 4,181,386, Cl. 359-17.00F.

Olympus Optical Co., Ltd.: *See*—
Ogiu, Hisao, 4,181,131, Cl. 128-303.150.
Sato, Masaaki, 4,181,089, Cl. 116-278.000.

Onimaru, Masayuki: *See*—
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,181,365, Cl. 301-67.000.

Onishi, Hisao; Numazawa, Ryozo; and Takeda, Hitoshi, to Mitsubishi Rayon Co., Ltd. Process and apparatus for waste water treatment. 4,181,604, Cl. 210-8.000.

Opderbeck, Fritz: *See*—
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbeck, Fritz; and Brachthauser, Karl-Heinz, 4,181,796, Cl. 536-1.000.

OPTI Patent-, Forschungs- und Fabrikations-AG: *See*—
Frohlich, Alfons; and Ranalli, Horst, 4,181,159, Cl. 139-116.000.

Optical Art Camera Corporation: *See*—
Proulx, J. J. Andre, 4,181,428, Cl. 355-75.000.

Original Hanau Quartzlampen GmbH: *See*—
Kockott, Dieter; and Bensel, Joachim, 4,181,926, Cl. 362-33.000.

Ortelli, Aurelis, to Riva Calzoni S.p.A. Distributor for hydraulic motors. 4,181,067, Cl. 91-485.000.

Osborne, Robert L., to Westinghouse Electric Corp. Anticipative turbine control. 4,181,840, Cl. 290-40.00R.

Osch, John V. Display device. 4,180,931, Cl. 40-219.000.

Osheroff, Gene W., to McQuay-Perflex, Inc. Fluidic-amplifier device having tube in outlet channel. 4,181,153, Cl. 137-838.000.

Osofsky, Raymond C., to Singer Company, The. Face vertex correction for real-time simulation of a polygon face object system. 4,181,953, Cl. 364-515.000.

Ostrowski, Richard C., to Caterpillar Tractor Co. Microwave drying of ceramic shell molds. 4,180,918, Cl. 34-13.000.

Otani, Tadashi: *See*—
Tatsumi, Toshio; Otani, Tadashi; and Yamazi, Masami, 4,181,923, Cl. 361-293.000.

Otis Engineering Corporation: *See*—
Cox, Don C., 4,181,149, Cl. 137-614.020.
Gazda, Imre I., 4,181,344, Cl. 294-86.180.

Ouchida, Akira: *See*—
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, 4,181,610, Cl. 210-85.000.

Outlaw, Jeanette M. Modifiable receptacle teapot. 4,181,071, Cl. 99-317.000.

Owen, Bruce R., to Wallace Murray Corp. Centrifugal compressor and cover. 4,181,466, Cl. 415-204.000.

Owens, Bruce E.: *See*—
Fechtner, Harold F.; and Owens, Bruce E., 4,181,418, Cl. 354-277.000.

Owens-Corning Fiberglas Corporation: *See*—
Richter, C. Stephen; and Ault, Russell L., 4,181,287, Cl. 249-154.000.
Seymour, Merritt W.; and Jones, James E., 4,180,874, Cl. 4-173.00M.

Oy Tampella AB: *See*—
Pfaler, Johan v., 4,181,568, Cl. 162-343.000.

Oy Wartsila AB: *See*—
Hellman, Erkki, 4,180,998, Cl. 70-227.000.
Hurskainen, Oiva; and Kiraly, Franz, 4,180,999, Cl. 70-366.000.

Oyama, Shigeaki: *See*—
Kohzai, Yoshinori; Kawada, Shigeki; and Oyama, Shigeaki, 4,181,875, Cl. 318-252.000.

Oyama, Yoshishige: *See*—
Yamauchi, Teruo; Oyama, Yoshishige; and Miyakawa, Nobuaki, 4,181,944, Cl. 364-431.000.

Ozaki, Tadashi: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,181,110, Cl. 123-119.00A.

Paar, Gary E.: *See*—
Dannelly, Clarence C.; Ardell, Richard E.; and Paar, Gary E., 4,181,710, Cl. 424-33.000.

Pace Incorporated: *See*—
Litt, Kenneth C., 4,181,477, Cl. 417-560.000.

Paceco Division of Fruehauf Corporation: *See*—
Morrissey, George F., Jr.; and Wright, Lawrence A., 4,181,231, Cl. 212-21.000.

Pacific Electricord Company: *See*—
Dodge, Donald M., 4,181,394, Cl. 339-103.00R.

Page, Dennis B.: *See*—
Abstein, Henry T., Jr.; and Page, Dennis B., 4,181,025, Cl. 73-665.000.
Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., 4,181,026, Cl. 73-665.000.

Pagezy, Michel J.; and Loire, Rene, to Entreprise d'Equipments Mecaniques et Hydrauliques E.M.H. Oil-production platform and method of assembling and installing the same on a sea bed. 4,181,452, Cl. 405-203.000.

Paine, Ellis H., to Moldex, Inc. Method and belt of oriented nylon with rubber sheet adhered thereto. 4,181,550, Cl. 156-164.000.

Paliwoda, Eugene J.: *See*—
Bucher, John H.; and Paliwoda, Eugene J., 4,181,524, Cl. 75-123.00G.

Pangborn, Robert J., to Dow Chemical Company, The. Electrode and method of producing same. 4,181,585, Cl. 204-98.000.

Pankratz, Richard P.: *See*—
Work, Ray A., III; and Pankratz, Richard P., 4,181,528, Cl. 428-474.000.

Pansire, Dino G. Self-propelled self-guiding lawn mower. 4,180,964, Cl. 56-10.200.

Papajewski, Reinhold: *See*—
Kessler, Rolf E.; Papajewski, Reinhold; and Polixa, Dietmar, 4,181,088, Cl. 112-292.000.

Pape, Fritz G.: *See*—
Brand, Dieter; and Pape, Fritz G., 4,181,316, Cl. 280-11.200.

Papst-Motoren KG: *See*—
Muller, Rolf, 4,181,867, Cl. 310-156.000.

Parker-Hannifin Corporation: *See*—
Sharp, Bernard C., 4,181,472, Cl. 417-363.000.

Parker, John C., to Ferranti Limited. Photodiode circuit arrangements. 4,181,863, Cl. 307-311.000.

Parks, Leon C. Method and apparatus for effecting hyperthermic treatment. 4,181,132, Cl. 128-399.000.

Partridge, Leslie W.: *See*—
Dominy, Francis I.; Partridge, Leslie W.; and Peltola, Veikko K., 4,181,004, Cl. 73-1.0DV.

Pascoe, Robert D., to Westinghouse Air Brake Company. Railroad interlocking signal system with insulated joint failure and overrun protection. 4,181,278, Cl. 246-34.00R.

Paton, Neil E.: *See*—
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,181,000, Cl. 72-60.000.

Patterson, Michael P.: *See*—
Growe, Glen H.; Patterson, Michael P.; and Egberg, David C., 4,181,745, Cl. 426-250.000.

Pauletich, Joseph. Therapeutic imploder. 4,181,124, Cl. 128-66.000.

Payne, William J. Helical anchor. 4,181,060, Cl. 85-64.000.

Pearse, Howard J.: *See*—
Harris, Lewis K.; and Pearse, Howard J., 4,181,021, Cl. 73-317.000.

Pech, Gunther; and Galleithner, Hans, to Semperit Aktiengesellschaft. Apparatus for the bellowless vulcanization of tire blanks. 4,181,483, Cl. 425-36.000.

Pedergrass, John E.; and Wichman, Cynthia A., to Colgate-Palmolive Company. Stockings. 4,180,869, Cl. 2-240.000.

Peltola, Veikko K.: *See*—
Dominy, Francis I.; Partridge, Leslie W.; and Peltola, Veikko K., 4,181,004, Cl. 73-1.0DV.

Pennington, Ramona K. Patient restraint for use on a chair or the like. 4,181,358, Cl. 297-467.000.

Pensa, Carlo, to Massey-Ferguson Services N.V. Hydrostatic transmissions. 4,180,981, Cl. 60-435.000.

Pepe, Russell: *See*—
Brauch, Robert B.; and Pepe, Russell, 4,181,087, Cl. 112-264.100.

Pera, John D.: *See*—
Fenyes, Joseph G. E.; and Pera, John D., 4,181,806, Cl. 549-6.000.

Perrault, Frederick; and Perrault, Raymond E. Cable support structure. 4,181,279, Cl. 248-70.000.

Perrault, Raymond E.: *See*—
Perrault, Frederick; and Perrault, Raymond E., 4,181,279, Cl. 248-70.000.

Perry, Dennis A.; and Creasey, Roger H., to Hayden Nilos Conflow Limited. Safety cut-out devices. 4,181,828, Cl. 200-18.000.

Perry, Jack A. Pressure rise tube sampler. 4,181,022, Cl. 73-422.0TC.

Peters, John W.: *See*—
Hall, Thomas C.; and Peters, John W., 4,181,751, Cl. 427-53.100.

Peterson, Henry T.; and Hawkins, Dennis H., to Hughes Aircraft Company. Eutectic die attachment method for integrated circuits. 4,181,249, Cl. 228-121.000.

Petronis, John D.: *See—*
Mason, Richard C.; and Petronis, John D., 4,181,134, Cl. 128-689.000.

Petsch, Egon: *See—*
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, 4,181,706, Cl. 423-237.000.

Peyton, Richard H.: *See—*
Thornton, Donald I.; and Peyton, Richard H., 4,180,885, Cl. 15-250.320.

Pfaff, Werner: *See—*
Hitzel, Volker; Weyer, Rudi; Geisen, Karl; and Pfaff, Werner, 4,181,658, Cl. 424-266.000.

Pfaler, Johan v., to Oy Tampella AB. Headbox for a paper machine for the production of a fiber web of at least two plies. 4,181,568, Cl. 162-343.000.

Pfizer Inc.: *See—*
Sarges, Reinhard; and Belletire, John L., 4,181,728, Cl. 424-273.00R.
Sarges, Reinhard; and Belletire, John L., 4,181,729, Cl. 424-273.00R.

Phelps, Richard W., to Black Clawson Company, The. Dryer unit for web dryer section. 4,181,039, Cl. 74-665.0GA.

Philip, Morris. Sinker-needle motion reducer. 4,180,993, Cl. 66-107.000.

Phillips Cables Limited: *See—*
Beach, Shirley, 4,181,647, Cl. 264-45.900.

Phillips, Grover G., Jr., to NCR Corporation. Adaptive synchronizing circuit for decoding phase-encoded data. 4,181,919, Cl. 360-42.000.

Phillips Petroleum Company: *See—*
DeFord, Donald D., 4,181,006, Cl. 73-23.100.
Malick, Emil A., 4,181,576, Cl. 435-247.000.
Strope, Daniel J., 4,181,707, Cl. 423-386.000.

Pierrel S.p.A.: *See—*
Tricerri Zumin, Silvia; and Bianchetti, Alberto, 4,181,740, Cl. 424-274.000.

Pietro Laverda S.p.A.: *See—*
Zen, Marcello, 4,180,966, Cl. 56-208.000.

Piffath, Rodney S.; and Cole, John J., to International Fire Tool Corp. Gas lighter having slidably detachable head assembly. 4,181,493, Cl. 431-344.000.

Pilgram, Kurt H. G.; and Skiles, Richard D., to Shell Oil Company. Diphenylamine derivative herbicides. 4,181,519, Cl. 71-98.000.

Pilz, Otto, to Du Pont de Nemours, E. I., and Company. Positive non-silver systems containing nitrofuryldihydropyridine. 4,181,531, Cl. 430-270.000.

Pinckaers, B. Hubert, to Honeywell Inc. Means for correlation of digital display of a setpoint and an actual controlled value. 4,181,957, Cl. 364-557.000.

Pinhas, Henri: *See—*
Beranger, Serge; and Pinhas, Henri, 4,181,722, Cl. 424-250.000.

Pinter, Erwig: *See—*
Speck, Ulrich; Pinter, Erwig; Lachnit-Fixson, Ursula; and Hahn-Godeffroy, Johann-Diederich, 4,181,721, Cl. 424-243.000.

Pirz, Frank C.; and Rabiner, Lawrence R., to Bell Telephone Laboratories, Incorporated. Multiple template speech recognition system. 4,181,821, Cl. 179-1.0SD.

Place, Harry, to International Telephone and Telegraph Corporation. Automatic channel selector for a two-way transceiver in a multichannel communication system. 4,181,887, Cl. 325-15.000.

Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, to Rohm and Haas Company. Heteropolymer acrylic latices and textiles treated therewith. 4,181,769, Cl. 428-253.000.

Plavskikh, Vladimir D.: *See—*
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.

Pohl, Ludwig: *See—*
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,181,625, Cl. 252-299.000.

Polaroid Corporation: *See—*
Borror, Alan L.; Cincotta, Louis; Ellis, Ernest W.; Foley, James W.; and Kampe, Marcis M., 4,181,660, Cl. 548-110.000.
Land, Edwin H., 4,181,778, Cl. 429-53.000.

Polixa, Dietmar: *See—*
Kessler, Rolf E.; Papajewski, Reinhold; and Polixa, Dietmar, 4,181,088, Cl. 112-292.000.

Pollock, Stephen F., to Hudson Pulp & Paper Corp. Apparatus for producing paper towels. 4,181,068, Cl. 93-1.00A.

Polukhin, Dmitry I.: *See—*
Kononov, Ivan V.; Makushin, Mikhail P.; Polukhin, Dmitry I.; Popov, Vyacheslav E.; and Salov, Viktor P., 4,181,003, Cl. 72-441.000.

Poole, Ronald J.: *See—*
Schmitt, Robert H.; and Poole, Ronald J., 4,181,619, Cl. 252-32.500.

Popov, Vyacheslav E.: *See—*
Kononov, Ivan V.; Makushin, Mikhail P.; Polukhin, Dmitry I.; Popov, Vyacheslav E.; and Salov, Viktor P., 4,181,003, Cl. 72-441.000.

Popper, Felix B.; McCarthy, Jeremiah B.; and Hart, James R., to W. R. Grace & Co. Process for preparing metal chelates. 4,181,672, Cl. 260-429.00J.

Porter, James F., to Chase Bag Company. Method for producing double streams of side-welded bags in heat-welded pad form. 4,181,069, Cl. 93-35.00R.

Porter, Roy A.: *See—*
Fogarty, Thomas N.; Harshbarger, William R.; and Porter, Roy A., 4,181,564, Cl. 156-643.000.

Post Office, The: *See—*
Dyott, Richard B.; and Stevenson, John L., 4,181,515, Cl. 65-3.00A.

Pottier, Jacques, to Commissariat a l'Energie Atomique. Heavy ion accelerating structure and its application to a heavy-ion linear accelerator. 4,181,894, Cl. 328-233.000.

Powell, John R.: *See—*
Carolus, David T.; Edwards, Ralph W.; and Powell, John R., 4,181,268, Cl. 242-54.00A.

PPG Industries, Inc.: *See—*
Carlin, William W., 4,181,586, Cl. 204-98.000.
Leatherman, Ivan R., 4,181,626, Cl. 252-300.000.
Steiger, Roger A.; and Holden, Calvin B., 4,181,583, Cl. 204-67.000.
Steiger, Roger A.; and Holden, Calvin B., 4,181,584, Cl. 204-67.000.

Preformed Line Products Company: *See—*
Smith, Donald J., 4,181,814, Cl. 174-92.000.

Preikschat, Fritz K. Electrical impedance measuring apparatus for providing separate measurements of the conductivity and dielectric coefficient of various materials. 4,181,881, Cl. 324-57.00R.

Pressman, Gerald L.; and Gardiner, Kenneth W., to Electroprint, Inc. Electrostatic color printing systems and methods using modulated ion streams. 4,181,423, Cl. 355-4.000.

Preston, Frank J.: *See—*
Chandalia, Kiran B.; Preston, Frank J.; and Barnowski, Henry G., 4,181,781, Cl. 521-137.000.

Price, Charles A., to United States Steel Corporation. Conveyor protection system. 4,181,459, Cl. 414-161.000.

Price, Joseph C.; and Wood, John F, to Coats Company, Inc., The. Lower bead lubrication. 4,181,170, Cl. 157-1.100.

Pringle, William L., to United States Steel Corporation. Heat exchanger assembly. 4,181,173, Cl. 165-169.000.

Prodel, Ulrich H. Collapsible and stackable plastic transport case. 4,181,236, Cl. 220-6.000.

Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschrankter Haftung: *See—*
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbeck, Fritz; and Brachthauser, Karl-Heinz, 4,181,796, Cl. 536-1.000.

Proulx, J. J. Andre, to Optical Art Camera Corporation. Special effects compound and slide holder therefor. 4,181,428, Cl. 355-75.000.

Pryor, Edward G.: *See—*
Loshbough, Richard C.; and Pryor, Edward G., 4,181,946, Cl. 364-466.000.

Psarras, Theodore, to United States of America, Air Force. Symmetrical perfluoroalkylene oxide α,ω-diacyl fluorides. 4,181,678, Cl. 260-544.00F.

Psarras, Theodore, to United States of America, Air Force. ω-Iodoperfluoroalkylene oxide acyl fluorides. 4,181,679, Cl. 260-544.00F.

Pullman Incorporated: *See—*
Miller, Roy W., 4,181,336, Cl. 292-262.000.

Purdue Research Foundation: *See—*
Whistler, Roy L., 4,181,795, Cl. 536-4.000.

Purzycki, Kenneth L.: *See—*
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,181,631, Cl. 252-522.000.

Pyeatte, Samuel C.; and Austin, Michael M., to Sperry Rand Corporation. Method and appratus for initializing remote data communication equipment. 4,181,909, Cl. 340-147.0SY.

Quadricolor Technology L.P.: *See—*
Richman, Donald, 4,181,917, Cl. 358-36.000.

Querton, Jean-Pierre: *See—*
Vinel, Rene; Querton, Jean-Pierre; and Serville, Claude, 4,181,380, Cl. 308-233.000.

Quick, Leonard M.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for the hydrotreating of heavy hydrocarbon streams. 4,181,602, Cl. 208-216.0PP.

Quigley Company, Inc.: *See—*
Ogawa, Minoru, 4,181,258, Cl. 239-186.000.

Raaf, Helmut; L'Orange, Raul; and Harth, Helmut, to Blendax-Werke R. Schneider & Co. Cleaning agents for dentures. 4,181,621, Cl. 252-102.000.

Rabiner, Lawrence R.: *See—*
Pirz, Frank C.; and Rabiner, Lawrence R., 4,181,821, Cl. 179-1.0SD.

Rabus, Friedrich: *See—*
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, 4,181,112, Cl. 123-148.00E.

Radcliffe, Curtis E.: *See—*
Herring, Clarence R.; Mattern, Taylor F.; and Radcliffe, Curtis E., 4,181,367, Cl. 303-7.000.

Radecki, Dan J.: *See—*
Tajnai, Joseph D.; Chadwick, Curt H.; and Radecki, Dan J., 4,181,900, Cl. 331-94.50P.

Radulovic, Radoje; Karisik, Mustafa; and Wolfer, Klaus R., to Fa Wilh. Jul. Teufel. Universal-orthese. 4,180,870, Cl. 3-1.200.

Raidel, John E. Air spring and parallelogram suspension. 4,181,323, Cl. 280-711.000.

Railey, Malcolm R.: *See—*
Frey, Richard C.; Railey, Malcolm R.; and Wargo, Thomas J., 4,181,971, Cl. 364-900.000.

Rainey, David K.: *See—*
Newton, Roger F.; Roberts, Stanley M.; Rainey, David K.; and Dimsdale, Michael J., 4,181,674, Cl. 260-448.80R.

Ramsay, John M., to True Temper Corporation. Manufacture of golf club heads. 4,181,165, Cl. 144-325.000.

Ranalli, Horst: *See—*
Frohlich, Alfons; and Ranalli, Horst, 4,181,159, Cl. 139-116.000.
Rantala, Charles W., to General Motors Corporation. Molding clip. 4,180,957, Cl. 52-718.000.
Rapistan, Incorporated: *See—*
Krauss, Dale A.; and Chang, Robin L., 4,181,947, Cl. 364-478.000.
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, to Akzona Incorporated. Erosion control matting. 4,181,450, Cl. 405-19.000.
Rau, Jim L.; and Kinder, Mark R., to TRW Inc. Drive assembly. 4,181,042, Cl. 74-750.00R.
Ray, Leonard N., Jr.: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; and Ray, Leonard N., Jr., 4,181,497, Cl. 8-2.50A.
Rayburn, Charles C.; and Enstrom, Robert V., to Illinois Tool Works Inc. Machine and method for forming a pleated and wound electrical capacitor with a metallized dielectric. 4,181,552, Cl. 156-204.000.
Raymond, Kenneth N.: *See—*
Weitl, Frederick L.; and Raymond, Kenneth N., 4,181,654, Cl. 260-239.0BC.
Raytheon Company: *See—*
Collins, Michael J.; and Ching, Michael T. S., 4,181,976, Cl. 364-900.000.
Razran, Gilbert B. Apparatus for automatically testing vision by phase measurements. 4,181,407, Cl. 351-6.000.
RCA Corporation: *See—*
Babcock, William E., 4,181,874, Cl. 315-370.000.
Dingwall, Andrew G. F., 4,181,862, Cl. 307-225.00C.
Etzold, Karl-Friedrich, 4,181,864, Cl. 310-314.000.
Gange, Robert A., 4,181,871, Cl. 313-422.000.
Henderson, John G. N., 4,181,916, Cl. 358-27.000.
Lagoni, William A., 4,181,915, Cl. 358-27.000.
Liu, Shing-Gong; and Duigon, Ferdinand C., 4,181,755, Cl. 430-314.000.
Read, Reginald R. Drive transmission system. 4,181,044, Cl. 74-752.00E.
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., to Texas Medical Products, Inc. Blood oxygenator assembly method. 4,180,896, Cl. 29-157.00R.
Reed, Gary W.: *See—*
Holland, Kenneth C.; Reed, Gary W.; and Murphy, Desmond L., 4,181,903, Cl. 333-81.00R.
Regie Nationale des Usines Renault: *See—*
Roturier, Christian, 4,181,458, Cl. 409-265.000.
Reider, Samuel B.: *See—*
Herman, Avrum S.; and Reider, Samuel B., 4,180,972, Cl. 60-39.320.
Reilly, James A.: *See—*
Whitney, Donald B.; Reilly, James A.; and Young, John M., 4,181,409, Cl. 351-167.000.
Reinhard, Theodor: *See—*
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.
Reiss, John R.: *See—*
Balukin, Richard F.; and Reiss, John R., 4,181,369, Cl. 303-16.000.
Reitter, Werner: *See—*
Buschmann, Gerhard; Thievessen, Karl; Weiss, Peter; and Reitter, Werner, 4,181,847, Cl. 235-92.0CC.
Reliance Electric Company: *See—*
Loshbough, Richard C.; and Pryor, Edward G., 4,181,946, Cl. 364-466.000.
Michels, Charles E., 4,180,962, Cl. 53-556.000.
Renzi, Alfred A.: *See—*
Wagner, Eugene R.; and Renzi, Alfred A., 4,181,737, Cl. 424-319.000.
Reppert, Merlyn R., to W. R. Grace & Co. Strengthening means for decorative automotive wheel centers. 4,181,364, Cl. 301-8.000.
Rescorla, Charles L.: *See—*
Rubenstein, Raymond D.; Janke, Russell E.; and Rescorla, Charles L., 4,181,611, Cl. 210-149.000.
Research Corporation: *See—*
Kent, Harry A., Jr., 4,181,717, Cl. 424-177.000.
Research Institute for Medicine and Chemistry Inc.: *See—*
Barton, Derek H. R.; and Hesse, Robert H., 4,181,655, Cl. 260-239.00D.
Ret, Leo J. Club organizer for golf bag. 4,181,167, Cl. 150-1.50R.
Reuter, Gerhard; and Schnabel, Wolfram, to Metallgesellschaft Aktiengesellschaft. Process for the direct reduction of iron oxide-containing materials in a rotary kiln. 4,181,520, Cl. 75-36.000.
Rhodes, David: *See—*
Newman, Alec T.; and Rhodes, David, 4,181,162, Cl. 141-105.000.
Rhone-Poulenc Industries: *See—*
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,181,618, Cl. 252-51.50A.
Rialdi, Giorgio. Tooth paste composition. 4,181,712, Cl. 424-49.000.
Rich, Dennis E., to National Semiconductor Corporation. Method of applying polarized film to liquid crystal display cells. 4,181,554, Cl. 156-261.000.
Richardson, Warner G., to Caterpillar Tractor Co. Apparatus with masking means for continuously covering a slot therein. 4,180,925, Cl. 37-126.0AE.
Richman, Donald, to Quadricolor Technology L.P. Color television receiving system utilizing inferred high frequency signal components to reduce color infidelities in regions of color transitions. 4,181,917, Cl. 358-36.000.
Richter, C. Stephen; and Ault, Russell L., to Owens-Corning Fiberglas Corporation. Molding apparatus for rigid foam pipe insulation. 4,181,287, Cl. 249-154.000.
Rickert, Glenn E. Embedded body in soap. 4,181,695, Cl. 264-150.000.
Rickert, Milton E., Jr., to General Electric Company. Process for rendering surfaces permanently water wettable and novel products thus-produced. 4,181,773, Cl. 428-329.000.
Ricoh Company, Ltd.: *See—*
Higaya, Toshiaki; and Ariyama, Kenzo, 4,181,425, Cl. 355-15.000.
Satake, Yoshiaki, 4,181,912, Cl. 346-154.000.
Tsubuko, Kazuo, 4,181,620, Cl. 430-114.000.
Riddell, Martin C.; and Waring, Ian M., to Riddell, Martin Clark. Paper manufacture employing filler and acrylamide polymer conglomerates. 4,181,567, Cl. 162-168.0NA.
Riddell, Martin Clark: *See—*
Riddell, Martin C.; and Waring, Ian M., 4,181,567, Cl. 162-168.0NA.
Ridderstrom, Goran A. H., to Aktiebolaget Electrolux. Apparatus utilizing magnetic means for transferring articles to and from predetermined positions. 4,181,465, Cl. 414-590.000.
Ridge, David N.: *See—*
Hanifin, John W., Jr.; and Ridge, David N., 4,181,677, Cl. 260-465.00F.
Ridgeway, Marcus L., Jr. Space enclosing member. 4,180,867, Cl. 2-89.000.
Ridgway, H. Curtis. Rotary sprinkler impact arm spring adjustment. 4,181,259, Cl. 239-206.000.
Ridley, Richard D.; and Burton, Robert S., III, to Occidental Oil Shale, Inc. Gas collection system for oil shale retort. 4,181,361, Cl. 299-2.000.
Riedel, Tilo, to S.A. Etablissements. Combined ski brake and fastening device. 4,181,321, Cl. 280-605.000.
Riedel, Wolfgang: *See—*
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.
Rieth, Lawrence E.: *See—*
Mayer, William R.; and Rieth, Lawrence E., 4,181,831, Cl. 200-61.250.
Rigsby, Randle L. Door knob stopper. 4,181,339, Cl. 292-347.000.
Riva Calzoni S.p.A.: *See—*
Ortelli, Aurelis, 4,181,067, Cl. 91-485.000.
Rivetti, Enrico: *See—*
Vannini, Paolo; Rivetti, Enrico; and Bertone, Antonino, 4,181,373, Cl. 303-116.000.
Rizk, Nabil I.; and Valentich, Frank, to University of Pittsburgh, a part interest. Matrix recovery electrophoresis apparatus. 4,181,594, Cl. 204-299.00R.
Rizzo, Anthony A., to TRW Inc. Systems & Energy. Rotary mount characterized by variable coning motion. 4,181,283, Cl. 248-550.000.
Robbins, Alvin M.; and Robbins, Paul J. Method of making variable pleat paper. 4,181,070, Cl. 93-60.000.
Robbins, Paul J.: *See—*
Robbins, Alvin M.; and Robbins, Paul J., 4,181,070, Cl. 93-60.000.
Robert Bosch GmbH: *See—*
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, 4,181,112, Cl. 123-148.00E.
Ruf, Walter; and Krauss, Heinz, 4,181,113, Cl. 123-148.00E.
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.
Robert, Georg: *See—*
Koltai, Paul; and Robert, Georg, 4,181,498, Cl. 8-18.00A.
Roberts, Philip D.: *See—*
McOnie, Malcolm P.; Roberts, Philip D.; Rose, John B.; and Englin, Boris, 4,181,787, Cl. 526-62.000.
Roberts, Stanley M.: *See—*
Newton, Roger F.; Roberts, Stanley M.; Rainey, David K.; and Dimsdale, Michael J., 4,181,674, Cl. 260-448.80R.
Robertshaw Controls Company: *See—*
Brakebill, Harold G., 4,181,106, Cl. 123-117.00A.
Esposito, Felix F.; and Sepso, Roger P., 4,181,907, Cl. 335-170.000.
Robinson, Joseph G.; and Herbert, Lesley D., to Coal Industry (Patents) Limited. Phenolic resols blended with N-methylol carbazoles. 4,181,688, Cl. 525-390.000.
Rockwell International Corporation: *See—*
Hamilton, C. Howard; Paton, Neil E.; and Curnow, John M., 4,181,000, Cl. 72-60.000.
Jenkins, James R., 4,181,975, Cl. 364-900.000.
Roeschlau, Peter: *See—*
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, 4,181,575, Cl. 435-11.000.
Rohm and Haas Company: *See—*
Neubeck, Clifford E., 4,180,917, Cl. 34-5.000.
Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,181,769, Cl. 428-253.000.
Rohner, Peter: *See—*
Schatz, Friedrich; Marx, Karl-Heinz; and Rohner, Peter, 4,181,543, Cl. 148-127.000.
Rokach, Joshua: *See—*
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,181,661, Cl. 548-195.000.
Roland Corporation: *See—*
Suenaga, Noboru, 4,181,058, Cl. 84-1.160.
Roman, Gian F., to Claber S.p.A. Joint for tubular structural elements particularly for the jointing of the structural elements of hose carriages. 4,181,447, Cl. 403-4.000.

Rombusch, Konrad: *See*—
Maahs, Gunther; Rombusch, Konrad; and Zaar, Wolfgang, 4,181,790, Cl. 526-143.000.
Rondelli, Elder: *See*—
Hempel, Robert P., Jr.; and Rondelli, Elder, 4,180,959, Cl. 53-334.000.
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Derivatives of 2-iminothiazolidines and thiazolines. 4,181,661, Cl. 548-195.000.
Rose, Harold W.: *See*—
Williamson, Tommy L.; and Rose, Harold W., 4,181,435, Cl. 356-141.000.
Rose, John B.: *See*—
McOnie, Malcolm P.; Roberts, Philip D.; Rose, John B.; and Englin, Boris, 4,181,787, Cl. 526-62.000.
Rosenthal, Leo; Isaacson, Leonard M.; and Ziebarth, John A., to Chevron Research Company. Computer-aided graphics system including a computerized material control system and method of using same. 4,181,954, Cl. 364-520.000.
Ross, Louis, to Borg-Warner Corporation. Balanced gerotor device with eccentric drive. 4,181,479, Cl. 418-61.00B.
Ross Operating Valve Company: *See*—
Russell, Neil E.; Cameron, Russell J.; Zbell, Richard P.; and Schmaltz, Lloyd L., 4,181,148, Cl. 137-596.160.
Rossiter, Valentine J. Apparatus for examining the infrared spectrum of small quantities of materials in the vapor phase. 4,181,437, Cl. 356-246.000.
Rossler, Frederick W., Jr.: *See*—
Dola, Frank P.; and Rossler, Frederick W., Jr., 4,181,384, Cl. 339-14.00R.
Rost, David P.: *See*—
Schwab, Carl E.; and Rost, David P., 4,181,956, Cl. 364-521.000.
Rotter, Johann. Optical projection apparatus. 4,181,427, Cl. 355-43.000.
Roturier, Christian, to Regie Nationale des Usines Renault. Multiple-broach broaching machine. 4,181,458, Cl. 409-265.000.
Roussel UCLAF: *See*—
Smolikowski, Serge; and Herve, Jean J., 4,181,735, Cl. 424-304.000.
Roux, Marcel: *See*—
Malsot, Christian; and Roux, Marcel, 4,181,400, Cl. 350-96.210.
Rovee, David T.: *See*—
Linsky, Cary B.; and Rovee, David T., 4,181,127, Cl. 128-155.000.
Rozhkov, Leonid G.: *See*—
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Rube, Helmut: *See*—
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.
Rubenstein, Raymond D.; Janke, Russell E.; and Rescorla, Charles L., to International Harvester Company. Filter thermal bypass valve. 4,181,611, Cl. 210-149.000.
Rubinstein, William: *See*—
Fox, Elinor; Rubinstein, William; and Hamilton, William, 4,181,308, Cl. 273-237.000.
Rudle, Manfred: *See*—
Stoll, Kurt; and Rudle, Manfred, 4,181,141, Cl. 137-119.000.
Rudolph, Hans: *See*—
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,181,676, Cl. 260-463.000.
Rudzena, William L.: *See*—
Garrett, Scott T.; Kulle, Lee K.; and Rudzena, William L., 4,181,245, Cl. 222-450.000.
Rue, L. B.: *See*—
Young, Simon; and Rue, L. B., 4,181,265, Cl. 241-257.00R.
Ruf, Walter; and Krauss, Heinz, to Robert Bosch GmbH. Engine ignition system with voltage monitoring. 4,181,113, Cl. 123-148.00E.
Rusch, Reinhart: *See*—
Kruger, Hans-Rudolf; Rusch, Reinhart; and Arndt, Friedrich, 4,181,517, Cl. 71-73.000.
Ruske, Manfred: *See*—
Elser, Wolfgang; Hartwig, Ernst; and Ruske, Manfred, 4,181,668, Cl. 260-377.000.
Russell, Homer C.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Russell, Neil E.; Cameron, Russell J.; Zbell, Richard P.; and Schmaltz, Lloyd L., to Ross Operating Valve Company. Self monitoring double valve. 4,181,148, Cl. 137-596.160.
S. C. Cabling, Inc.: *See*—
Jensen, Floyd J., 4,181,401, Cl. 350-96.210.
S. G. Brown Limited: *See*—
Brook, David L., 4,180,916, Cl. 33-318.000.
SAB Industri AB: *See*—
Strom, Hans-Goran, 4,181,368, Cl. 303-15.000.
St. Amand, Robert, to National Blank Book Company, Inc. Filing device. 4,181,381, Cl. 312-183.000.
Saito, Kenitiro: *See*—
Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, 4,181,786, Cl. 525-327.000.
Saito, Takao: *See*—
Kitayama, Minoru; Saito, Takao; and Wake, Ryousuke, 4,181,580, Cl. 204-28.000.
Saito, Yasunori, to Sumitomo Electric Industries, Ltd. Apparatus for producing the insulating layer of a coaxial cable. 4,181,486, Cl. 425-113.000.
Sakakibara, Yukio: *See*—
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,181,884, Cl. 324-208.000.
Sakoda, Atsunobu: *See*—
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
Sakun, Anatoly F.: *See*—
Borisenko, Alexandr V.; Serebryakov, Evgeny A.; Sakun, Anatoly F.; and Bazin, Valentin T., 4,181,049, Cl. 82-1.00C.
Salov, Viktor P.: *See*—
Kononov, Ivan V.; Makushin, Mikhail P.; Polukhin, Dmitry I.; Popov, Vyacheslav E.; and Salov, Viktor P., 4,181,003, Cl. 72-441.000.
Salva S.A.: *See*—
Spiegelberg, Hans, 4,181,225, Cl. 206-494.000.
Samuelsson, Bengt I.: *See*—
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,181,725, Cl. 424-258.000.
Sanada, Masakatsu; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for feeding a fuel and a fuel feed device for use in an internal combustion engine. 4,181,111, Cl. 123-133.000.
Sandoz Ltd.: *See*—
Koltai, Paul; and Robert, Georg, 4,181,498, Cl. 8-18.00A.
Schenker, Erhard, 4,181,723, Cl. 424-250.000.
Sandvik Aktiebolag: *See*—
Lumen, Karl L. G., 4,181,187, Cl. 175-410.000.
Sano, Tsutomu; Takeuchi, Naoki; Kurumaji, Masanobu; and Nakatsukasa, Susumu, to Kobe Steel, Limited. Waste gas discharging device for use in injection molding machine. 4,181,510, Cl. 55-183.000.
Santo, Yoshiji, to Nippon Suisan Kabushiki Kaisha. Method of processing loose herring roe. 4,181,739, Cl. 426-272.000.
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., to Thetford Corporation. Portable toilets. 4,180,876, Cl. 4-321.000.
Sarges, Reinhard; and Belletire, John L., to Pfizer Inc. Spiro-polycyclicimidazolidinedione derivatives. 4,181,728, Cl. 424-273.00R.
Sarges, Reinhard; and Belletire, John L., to Pfizer Inc. Phenyl or phenoxy substituted spiro-imidazolidinedione derivatives. 4,181,729, Cl. 424-273.00R.
Sarli, Michael S.: *See*—
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,181,598, Cl. 208-58.000.
Satake, Yoshiaki, to Ricoh Co., Ltd. Electrostatic recording apparatus comprising improved electrode switching means. 4,181,912, Cl. 346-154.000.
Sato, Masaaki, to Olympus Optical Co., Ltd. Casette tape take-up indicator. 4,181,089, Cl. 116-278.000.
Satomura, Masato; Kiritani, Masataka; and Nishimura, Taiichi, to Fuji Photo Film Co., Ltd. Recording element. 4,181,328, Cl. 282-27.500.
Satterwhite, Charles R., to Unit Rig & Equipment Co. Digging bucket cylinder powered ejector system. 4,180,927, Cl. 37-190.000.
Saucier, Ernest. Window insulation. 4,180,942, Cl. 49-125.000.
Saunders-Roe Developments Limited: *See*—
Burrows, Kenneth; and Hiscutt, Robert, 4,181,925, Cl. 362-29.000.
Saurenman, Phillip E.: *See*—
Casler, William A.; and Saurenman, Phillip E., 4,181,392, Cl. 339-95.00R.
Savin Corporation: *See*—
Gardiner, Kenneth W., 4,181,094, Cl. 118-652.000.
Savins, Joseph G., to Mobil Oil Corporation. Oil recovery by waterflooding with thickened surfactant solutions. 4,181,178, Cl. 166-274.000.
Sawabu, Hitoshi: *See*—
Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, 4,181,694, Cl. 264-41.000.
Schaeffer Homberg GmbH: *See*—
Stocker, Alberto, 4,180,891, Cl. 24-206.00B.
Schaffel, Gerson S.: *See*—
Sheer, Charles; Korman, Samuel; and Schaffel, Gerson S., 4,181,704, Cl. 423-230.000.
Schaible, Wolfgang; and Senn, Hanspeter, to BBC Brown Boveri & Company Limited. Signal distribution circuit including load regulator. 4,181,841, Cl. 307-30.000.
Schank, Richard L.: *See*—
Chu, Joseph Y. C.; Schank, Richard L.; and Tutihasi, Simpei, 4,181,772, Cl. 430-58.000.
Schapink, Walter, to Sun Electric Corporation. Process and apparatus for testing hydraulic control systems. 4,181,016, Cl. 73-168.000.
Schatz, Friedrich; Marx, Karl-Heinz; and Rohner, Peter, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Making a super conductor. 4,181,543, Cl. 148-127.000.
Schebece, Frank, to Colgate-Palmolive Company. Elastic detergent bar. 4,181,632, Cl. 252-542.000.
Schenesse, Klemens: *See*—
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, 4,181,450, Cl. 405-19.000.
Schenker, Erhard, to Sandoz Ltd. 3-Hydrazino-5,6,7,8,9,10-hexahydrocycloocta[c]pyridazines. 4,181,723, Cl. 424-250.000.
Scherbatskoy, Serge A., to Exxon Production Research Company. Soft-wire conductor wellbore telemetry system and method. 4,181,184, Cl. 175-65.000.

Schering Aktiengesellschaft: *See*—
Dahms, Wolfgang, 4,181,582, Cl. 204-52.00R.
Kruger, Hans-Rudolf; Rusch, Reinhart; and Arndt, Friedrich, 4,181,517, Cl. 71-73.000.
Speck, Ulrich; Pinter, Erwig; Lachnit-Fixson, Ursula; and Hahn-Godeffroy, Johann-Diederich, 4,181,721, Cl. 424-243.000.

Scherz, Wilhelm. Windshield wiper system. 4,180,886, Cl. 15-250.040.

Schieber, Hans; Krause Erich both of; and Schimko, Reinhold, to Universall Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Pattern setting arrangement of knitting machine. 4,180,992, Cl. 66-75.100.

Schiller, Joseph E.; and Khalafalla, Sanaa E., to United States of America, Interior. Removal of asbestos fibers from water. 4,181,607, Cl. 210-36.000.

Schimko, Reinhold: *See*—
Schieber, Hans; Krause Erich both of; and Schimko, Reinhold, 4,180,992, Cl. 66-75.100.

Schindler, Rudolf A.: *See*—
United States of America, National Aeronautics and Space Administration; and Schindler, Rudolf A., 4,181,440, Cl. 356-346.000.

Schinner, Edward N.: *See*—
Cates, Robert E.; and Schinner, Edward N., 4,181,691, Cl. 261-111.000.

Schlapp, Werner; and Wiessner, Willi, to Ernst Leitz Wetzlar GmbH. Interchangeable lens for SLR-cameras having TTL light metering. 4,181,419, Cl. 354-286.000.

Schmaeng, John F., to Beloit Corporation. Doctor bearing integral pressure lubrication. 4,181,378, Cl. 308-36.100.

Schmaltz, Lloyd L.: *See*—
Russell, Neil E.; Cameron, Russell J.; Zbell, Richard P.; and Schmaltz, Lloyd L., 4,181,148, Cl. 137-596.160.

Schmelzer Corporation: *See*—
Benjamin, Benjamin C.; and LaVene, Leon F., 4,181,065, Cl. 91-167.00R.

Schmid, Jurgen; Schutte, Rolf; and Steinhaus, Harald, to Gesellschaft fur Kernforschung m.b.H. Method and apparatus for separating desublimatable components from gas mixtures. 4,181,508, Cl. 55-82.000.

Schmid, Rolf: *See*—
Kreibich, Ursula; and Schmid, Rolf, 4,181,643, Cl. 260-40.00R.

Schmidt, Dieter H.; and Garman, Dean H., to Cincinnati Milacron Inc. Grinding method. 4,180,947, Cl. 51-326.000.

Schmidt, Heinz: *See*—
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, 4,181,685, Cl. 525-402.000.

Schmidt, Rolf: *See*—
Bomer, Bruno; Schnoring, Hildegard; and Schmidt, Rolf, 4,181,639, Cl. 260-29.6WB.

Schmitt, Robert H.; and Poole, Ronald J., to Mobil Oil Corporation. Antiwear composition. 4,181,619, Cl. 252-32.500.

Schmitz-Steger, Werner. Arrangement for compact winding of a continuously fed wire. 4,181,267, Cl. 242-25.00R.

Schmoock, Roy F., to Fischer & Porter Co. Unitary electromagnetic flowmeter. 4,181,018, Cl. 73-194.0EM.

Schnabel, Wolfram: *See*—
Reuter, Gerhard; and Schnabel, Wolfram, 4,181,520, Cl. 75-36.000.

Schnetger, Jochen: *See*—
Clamroth, Rudolf; Loske, Hans; and Schnetger, Jochen, 4,181,023, Cl. 73-432.00R.

Schnoring, Hildegard: *See*—
Bomer, Bruno; Schnoring, Hildegard; and Schmidt, Rolf, 4,181,639, Cl. 260-29.6WB.

Schommer, Gerard E.: *See*—
Swenson, Richard F.; Eimen, Shawn H.; Gryga, John J., Jr.; and Schommer, Gerard E., 4,181,357, Cl. 297-353.000.

Schornig, Eberhard: *See*—
Blume, Erich; and Schornig, Eberhard, 4,181,420, Cl. 354-299.000.

Schramm, Horst. Tiltable mold and shed means. 4,181,485, Cl. 425-88.000.

Schroder, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Device for optional dynamic compression or expansion. 4,181,896, Cl. 330-282.000.

Schuhmacher, Gunter; Fottinger, Walter; Graber, Adolf; and Fahrbach, Erich, to Carl Freudenberg, Firma. Isocyanate-terminated branched polyethylene glycol and polyester polyurethane foams. 4,181,770, Cl. 428-260.000.

Schulein, Rolf G., to Leifheit International Gunter Leifheit GmbH. Compact kitchen appliance. 4,181,163, Cl. 141-381.000.

Schulte, Harvey L.: *See*—
Szasz, Peter R.; and Schulte, Harvey L., 4,181,214, Cl. 198-467.000.

Schulte, Louis T.: *See*—
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 4,181,966, Cl. 364-715.000.

Schultz, Thomas E., Jr., to Minnesota Mining and Manufacturing Company. Tamper indicating label. 4,180,929, Cl. 40-2.200.

Schulze, Bernhard: *See*—
Hoffmann, Rudiger; Feichtiger, Dieter; Reinhard, Theodor; Haug, Ernst; Schulze, Bernhard; and Bleibtreu, Emil, 4,181,191, Cl. 180-289.000.

Schumann, Hiltraut; and Dathe, Christian, to VEB Chemiewerk Nunchritz. Process for preparing dimethylhydrogenchlorosilane. 4,181,673, Cl. 260-448.20T.

Schurger, Rainer: *See*—
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.

Schutte, Rolf: *See*—
Schmid, Jurgen; Schutte, Rolf; and Steinhaus, Harald, 4,181,508, Cl. 55-82.000.

Schwab, Carl E.; and Rost, David P., to General Signal Corporation. Digital indicia generator employing compressed data. 4,181,956, Cl. 364-521.000.

Schwarting, Karl-Heinz: *See*—
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, 4,181,363, Cl. 299-17.000.

Schwarz, Hans-Helmut: *See*—
Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, 4,181,810, Cl. 568-807.000.

Schwoboda, George F.; and Wingrove, Robert C., to Medical Devices, Inc. Serial release mechanism and drainage monitor embodying the same. 4,181,121, Cl. 128-762.000.

Scientific Drilling Controls, Inc.: *See*—
Zuvela, Bernard R.; Teys, Raymond W.; and Johnson, Richard A., 4,181,014, Cl. 73-151.000.

Scofield, William L.: *See*—
Arnold, Paul W.; Scofield, William L.; Borst, Ronald W.; and Scott, Vern D., 4,181,238, Cl. 220-314.000.

Scott, Alwyn C., to Wisconsin Alumni Research Foundation. Fluxon oscillators utilizing a ring shaped Josephson junction. 4,181,902, Cl. 331-107.00S.

Scott, Vern D.: *See*—
Arnold, Paul W.; Scofield, William L.; Borst, Ronald W.; and Scott, Vern D., 4,181,238, Cl. 220-314.000.

Scuka, Viktor: *See*—
Lundberg, Bo E. O.; and Scuka, Viktor, 4,181,815, Cl. 174-101.500.

Sea Tank Co.: *See*—
Vache, Jean-Claude, 4,181,453, Cl. 405-203.000.

Sealco Air Controls, Inc.: *See*—
Herring, Clarence R.; Mattern, Taylor F.; and Radcliffe, Curtis E., 4,181,367, Cl. 303-7.000.

Sedore, Ernest. Stove. 4,181,116, Cl. 126-60.000.

Seidel, Hans: *See*—
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerscheimann, Detlef, 4,181,575, Cl. 435-11.000.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Balancing impedance circuit. 4,181,824, Cl. 179-170.00D.

Seilenbinder, Richard W., to Briggs & Stratton Corporation. Back-up safety system for machine having rotatable part declutched by dead man control. 4,181,206, Cl. 192-0.084.

Sekikawa, Nobuyoshi: *See*—
Ikenoue, Shinpei; Sekikawa, Nobuyoshi; and Masuda, Takao, 4,181,530, Cl. 430-620.000.

Selas, George J., to Allen-Bradley Company. Time delay switch actuating mechanism. 4,181,829, Cl. 200-33.00R.

Sels, Francis J.; Kokelenberg, Hendrik E.; and Van Veelen, George F., to AGFA-GEVAERT N.V. Hardening of proteinaceous materials. 4,181,529, Cl. 430-626.000.

Semperit Aktiengesellschaft: *See*—
Pech, Gunther; and Galleithner, Hans, 4,181,483, Cl. 425-36.000.

Senders, John W. Vision compensation. 4,181,408, Cl. 351-159.000.

Senn, Hanspeter: *See*—
Schaible, Wolfgang; and Senn, Hanspeter, 4,181,841, Cl. 307-30.000.

Seppelfrick, Merle N. Antenna bracket for exterior walls. 4,181,284, Cl. 248-514.000.

Sepso, Roger P.: *See*—
Esposito, Felix F.; and Sepso, Roger P., 4,181,907, Cl. 335-170.000.

Seragnoli, Enzo, to G. D. Societa per Azioni. Labelling device. 4,181,561, Cl. 156-566.000.

Serebryakov, Evgeny A.: *See*—
Borisenko, Alexandr V.; Serebryakov, Evgeny A.; Sakun, Anatoly F.; and Bazin, Valentin T., 4,181,049, Cl. 82-1.00C.

Serville, Claude: *See*—
Vinel, Rene; Querton, Jean-Pierre; and Serville, Claude, 4,181,380, Cl. 308-233.000.

Seto, Stanford P.: *See*—
Stenger, Richard E.; Ekstedt, Edward E.; and Seto, Stanford P., 4,180,974, Cl. 60-39.710.

Setzer, Herbert J.: *See*—
Lesieur, Roger R.; Setzer, Herbert J.; and Hawkins, James R., 4,181,503, Cl. 48-196.00A.

Severin, Gerard E., to Du Pont de Nemours, E. I., and Company. Body armor laminate. 4,181,768, Cl. 428-252.000.

Sexton, Carl E.; and Spector, George. Half ball game. 4,181,302, Cl. 273-95.00R.

Sextro, Gunter: *See*—
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, 4,181,685, Cl. 525-402.000.

Seymour, Merritt W.; and Jones, James E., to Owens-Corning Fiberglas Corporation. Bathtub assembly. 4,180,874, Cl. 4-173.00M.

SGS-ATES Component Elettronici S.p.A.: *See*—
Murari, Bruno; and Coccetti, Silvano, 4,181,878, Cl. 323-94.00R.

Shaffer, Gary W.; and Purzycki, Kenneth L., to Givaudan Corporation. Alpha-hydroxyalkyl-4-tertiary-alkylcyclohexane perfume compositions. 4,181,631, Cl. 252-522.000.

Sharp, Bernard C., to Parker-Hannifin Corporation. Liquid dispensing windshield washer pump. 4,181,472, Cl. 417-363.000.

Sharp Kabushiki Kaisha: *See—*
Iwase, Tetsuo, 4,181,848, Cl. 235-92.0DN.
Tateishi, Iwao, 4,181,959, Cl. 364-562.000.
Tateishi, Iwao; and Kakutani, Nobuyasu, 4,181,960, Cl. 364-562.000.
Sharp, Russell G.: *See—*
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,180,896, Cl. 29-157.00R.
Shaw, David N., to Dunham-Bush, Inc. Refrigeration system on/off cycle. 4,180,986, Cl. 62-192.000.
Shaw, David N., to Dunham-Bush, Inc. Vertical axis hermetic rotary helical screw compressor with improved rotary bearings and oil management. 4,181,474, Cl. 417-366.000.
Sheer, Charles; Korman, Samuel; and Schaffel, Gerson S., to Sheer-Korman Associates, Inc. Process for the removal of sulfurous gases from the emissions of chemical processes. 4,181,704, Cl. 423-230.000.
Sheer-Korman Associates, Inc.: *See—*
Sheer, Charles; Korman, Samuel; and Schaffel, Gerson S., 4,181,704, Cl. 423-230.000.
Shell Oil Company: *See—*
Pilgram, Kurt H. G.; and Skiles, Richard D., 4,181,519, Cl. 71-98.000.
Shellenberger, Robert L. Process for producing simulated wooden articles. 4,181,763, Cl. 428-142.000.
Shelton, Naaman, Jr.: *See—*
Boon, Daniel A.; Jones, R. Larry; and Shelton, Naaman, Jr., 4,181,037, Cl. 74-569.000.
Shelvoke and Drewry Limited: *See—*
Tillson, Thomas W., 4,181,464, Cl. 414-501.000.
Shenier, Richard S., to Gentex Corporation. Personal amplifier system. 4,181,818, Cl. 179-1.00P.
Shephard, Margaret C.; and Worthington, Paul A., to Imperial Chemical Industries Limited. Method of regulating plant growth using triazole and imidazole compounds. 4,181,518, Cl. 71-76.000.
Shiba, Haruo; and Okamura, Masatoshi, to TDK Electronics Company, Limited. Tape cassette reel. 4,181,272, Cl. 242-74.100.
Shimada, Masayoshi: *See—*
Fukuda, Takashi; Shimada, Masayoshi; Ishizaki, Nobuo; and Iwahori, Shoichi, 4,181,513, Cl. 55-316.000.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,181,033, Cl. 74-243.00R.
Shimatani, Tsuyoshi: *See—*
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, 4,181,228, Cl. 209-552.000.
Shimizu, Mikio: *See—*
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; and Kouyama, Toshitake, 4,181,914, Cl. 358-1.000.
Shimoji, Toshikuni: *See—*
Kunii, Yutaka; and Shimoji, Toshikuni, 4,181,120, Cl. 128-660.000.
Shimp, Alan B.: *See—*
Matsko, Joseph J.; Shimp, Alan B.; and Skalka, Paul, 4,181,922, Cl. 361-115.000.
Shin, Seon H. Process for preparing steam-kneaded vermicelli products. 4,181,746, Cl. 426-335.000.
Shinoda, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Idle speed controller for internal combustion engines. 4,181,104, Cl. 123-102.000.
Shinshu Seiki Kabushiki Kaisha: *See—*
Hirabayashi, Tetsuro; and Shishiuchi, Hiromi, 4,181,443, Cl. 400-320.000.
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, to Takeda Chemical Industries, Ltd. Blood leak detector suitable for use with artificial kidneys. 4,181,610, Cl. 210-85.000.
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, to Nippondenso Co., Ltd. Rotational position detection device using a reference mark and two sensors spaced integer times apart. 4,181,884, Cl. 324-208.000.
Shirota, Yasushi; Kishimoto, Satoru; Takeshita, Kunio; and Ando, Yoshio, to Japanese National Railways. Method and apparatus for optical method of measuring rail displacement. 4,181,430, Cl. 356-1.000.
Shishido, Toshimasa: *See—*
Nomura, Toshio; and Shishido, Toshimasa, 4,181,107, Cl. 123-119.00F.
Shishiuchi, Hiromi: *See—*
Hirabayashi, Tetsuro; and Shishiuchi, Hiromi, 4,181,443, Cl. 400-320.000.
Shockley, Lestle R.: *See—*
Kenyon, John W.; Shockley, Lestle R.; and Van Niel, Paul R., 4,181,237, Cl. 220-71.000.
Shockley, Thomas D., to Dresser Industries, Inc. Connecting link for mining chain. 4,181,035, Cl. 74-250.00R.
Shomura, Takashi: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.
Shono, Tetsuji: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,181,411, Cl. 354-53.000.
Shreeve, Raymond P.: *See—*
West, James C., Jr.; and Shreeve, Raymond P., 4,181,962, Cl. 364-565.000.
Sibley, Henry C., to General Signal Corporation. Vital relay driver having controlled response time. 4,181,849, Cl. 235-92.00T.
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, to Robert Bosch GmbH. Method and apparatus for automatic implementation of fade-in, fade-out and fade-over recording effects on film. 4,181,410, Cl. 352-91.00R.
Sick, Erwin, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Optical apparatus. 4,181,398, Cl. 350-96.100.
Siegel, Israel. Instant return-stroke differential temperature engine. 4,180,982, Cl. 60-531.000.
Siemens Aktiengesellschaft: *See—*
Heider, Ulrich, 4,181,444, Cl. 400-568.000.
Kober, Rudolf, 4,181,936, Cl. 364-200.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Deutschlander, Gert; and Low, Martin, 4,181,213, Cl. 198-419.000.
Kopp, Georg, 4,181,052, Cl. 83-79.000.
Sigwalt, Pierre; Guyot, Patrick; Fontanille, Michel; and Vairon, Jean-Pierre, to Societe Chimique des Charbonnages—CdF CHIMIE. Diphenyl compounds that are intermediates in preparation of polymerization initiators. 4,181,684, Cl. 585-25.000.
Singer Company, The: *See—*
Brauch, Robert B.; and Pepe, Russell, 4,181,087, Cl. 112-264.100.
Cohen, Edwin, 4,181,405, Cl. 350-331.000.
Flower, Robert A., 4,181,432, Cl. 356-28.000.
Kessler, Rolf E.; Papajewski, Reinhold; and Polixa, Dietmar, 4,181,088, Cl. 112-292.000.
Osofsky, Raymond C., 4,181,953, Cl. 364-515.000.
Sinner, Michael: *See—*
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbeck, Fritz; and Brachthauser, Karl-Heinz, 4,181,796, Cl. 536-1.000.
Siwiec Beckwith, Elaine C.: *See—*
Chattha, Mohinder S.; Siwiec Beckwith, Elaine C.; and van Oene, Henk, 4,181,785, Cl. 525-161.000.
Sjogren, Kent. Darts having low rebound frequency. 4,181,303, Cl. 273-106.50B.
Skalka, Paul: *See—*
Matsko, Joseph J.; Lange, Emroy W.; and Skalka, Paul, 4,181,906, Cl. 335-6.000.
Matsko, Joseph J.; Shimp, Alan B.; and Skalka, Paul, 4,181,922, Cl. 361-115.000.
Skerlos, Peter C., to Zenith Radio Corporation. Channel change indication circuit. 4,181,891, Cl. 325-464.000.
SKF Compagnie d'Applications Mechaniques: *See—*
Vinel, Rene; Querton, Jean-Pierre; and Serville, Claude, 4,181,380, Cl. 308-233.000.
SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,181,374, Cl. 308-6.00C.
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.
Skidmore, Michael. Apparatus for playing a game. 4,181,305, Cl. 273-153.00S.
Skiles, Richard D.: *See—*
Pilgram, Kurt H. G.; and Skiles, Richard D., 4,181,519, Cl. 71-98.000.
Skis Rossignol S.A. Club Rossignol S.A. Societe Anonyme: *See—*
Cholat-Serpoud, Gerard; and Legrand, Maurice, 4,181,301, Cl. 273-73.00C.
Sloan, Cephas H.: *See—*
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,181,640, Cl. 260-30.40R.
Smith, Donald J., to Preformed Line Products Company. Splice case with gasket and closure mechanism therefor. 4,181,814, Cl. 174-92.000.
Smith, Edward W.: *See—*
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,181,794, Cl. 528-496.000.
Smith, Hugh D.; and Blackmore, David M., to McDonnell Douglas Corporation. Dual lost motion mechanism for an aircraft door. 4,180,943, Cl. 49-279.000.
Smith International, Inc.: *See—*
Bolton, Jimmie B., 4,181,845, Cl. 219-8.500.
Oelke, Erwin S., 4,181,377, Cl. 308-8.200.
Smith, Kenneth W.: *See—*
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,181,598, Cl. 208-58.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,181,730, Cl. 424-273.00R.
Smith, Winthrop W., Jr., to Westinghouse Electric Corp. System for detecting and isolating static bit faults in a network of arithmetic units. 4,181,969, Cl. 364-739.000.
Smiths Industries Limited: *See—*
Baker, Peter D.; and Luke, Douglas V., 4,181,397, Cl. 350-96.200.
Smolikowski, Serge; and Herve, Jean J., to Roussel UCLAF. Nematocidal cyclopropane carboxylates. 4,181,735, Cl. 424-304.000.
Smulders, Hendricus F. G.: *See—*
Wesselink, Gustaaf A.; Franken, Adrianus J. J.; and Smulders, Hendricus F. G., 4,181,155, Cl. 138-30.000.
Smythe, Lloyd E.; and Matousek, Jaroslav P. Direct temperature control and measurement for furnace atomizers in atomic spectroscopy. 4,181,438, Cl. 356-312.000.
Snow Band Milk Products Co., Ltd.: *See—*
Niki, Hiroshi; Katou, Tuneo; Deya, Eiki; Doi, Toru; Ahiko, Kenkichi; and Hayashi, Hiromichi, 4,181,749, Cl. 426-643.000.
Snow, Charles C. All-weather hat accessory. 4,180,868, Cl. 2-203.000.
Socapex: *See—*
Malsot, Christian; and Roux, Marcel, 4,181,400, Cl. 350-96.210.

S.A. Delta Neu: *See*—
Neu, Francis, 4,181,690, Cl. 261-29.000.
S.A. Etablissements: *See*—
Riedel, Tilo, 4,181,321, Cl. 280-605.000.
S.A. Martin: *See*—
Capdeboscq, Bernard, 4,181,298, Cl. 271-5.000.
Gattus, Yves, 4,181,076, Cl. 101-350.000.
Societe Chimique des Charbonnages—CdF CHIMIE: *See*—
Sigwalt, Pierre; Guyot, Patrick; Fontanille, Michel; and Vairon, Jean-Pierre, 4,181,684, Cl. 585-25.000.
Societe Lignes Telegraphiques et Telephoniques: *See*—
Bouvard, Andre; and Mahieu, Jean-Rene, 4,181,905, Cl. 333-255.000.
Solid Photography Inc.: *See*—
DiMatteo, Paul, 4,180,930, Cl. 40-160.000.
Sony Corporation: *See*—
Yamamoto, Kenji, 4,181,890, Cl. 325-316.000.
Yoshida, Tadao, 4,181,895, Cl. 330-279.000.
Souma, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-rattle and positioning member for a disc brake pad. 4,181,200, Cl. 188-73.500.
Southwire Company: *See*—
Cofer, Daniel B.; Chia, Enrique C.; Burnitte, John E.; and Kaltenberg, Theodor W., 4,181,091, Cl. 118-63.000.
Spanke, Theodore J., to Add-a-Bed Corporation. Flat bed conversion kit for pickup trucks. 4,181,351, Cl. 296-100.000.
Sparks, Robert E.: *See*—
Mason, Norbert S.; and Sparks, Robert E., 4,181,718, Cl. 424-180.000.
Spaziante, Placido M.; and Nidola, Antonio, to Diamond Shamrock Technologies S.A. Rechargeable zinc halogen battery. 4,181,777, Cl. 429-50.000.
Spear, John F.: *See*—
Lemon, Maurice C.; and Spear, John F., 4,180,994, Cl. 68-18.00F.
Speck, Ulrich; Pinter, Erwig; Lachnit-Fixson, Ursula; and Hahn-Godefroy, Johann-Diederich, to Schering Aktiengesellschaft. Depot preparations in an oily, unsaturated solution for intramuscular injection. 4,181,721, Cl. 424-243.000.
Spector, George: *See*—
Sexton, Carl E.; and Spector, George, 4,181,302, Cl. 273-95.00R.
Speer, Lawrence. Method for repairing plastic-like materials. 4,181,547, Cl. 156-98.000.
Spehrley, C. W., Jr., to Xerox Corporation. Fixed stapler head. 4,181,248, Cl. 227-3.000.
Speranza, James L. Folding transportable boat. 4,180,881, Cl. 9-2.00F.
Sperry Rand Corporation: *See*—
Kent, William H.; and Nardi, Anthony P., 4,181,468, Cl. 417-63.000.
McMahon, Donald H.; and Nelson, Arthur R., 4,181,399, Cl. 350-96.140.
Pyeatte, Samuel C.; and Austin, Michael M., 4,181,909, Cl. 340-147.0SY.
Spiegelberg, Hans, to Salva S.A. Wet-tissue pack. 4,181,225, Cl. 206-494.000.
Spikes, Roger H.; and Blackburn, William J. G., to Vandervell Products Limited. Methods of forming angled end bearing liners. 4,180,895, Cl. 29-149.50C.
Square D Company: *See*—
Miracle, William C., 4,181,836, Cl. 200-144.00R.
Stachnik, Joseph: *See*—
Oley, Leonard; and Stachnik, Joseph, 4,181,154, Cl. 137-863.000.
Stadler, Gary D.; Chambers, Patrick H.; and Bowden, John W. Gas flow indicator having a magnetic field sensitive switch that is responsive to the position of a magnet secured to a piston. 4,181,835, Cl. 200-82.00E.
Stahl, Torvald F., to ITT Industries, Inc. Oil housing. 4,181,475, Cl. 417-372.000.
Stahl-Urban Company: *See*—
Conner, William R., Jr., 4,181,085, Cl. 112-121.120.
Stamicarbon, B.V.: *See*—
de Cooker, Mario G. R. T.; and Haemers, Anita G. W. G., 4,181,801, Cl. 544-192.000.
Standard Oil Company (Indiana): *See*—
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,181,602, Cl. 208-216.0PP.
Stanley Electric Co., Ltd.: *See*—
Aizawa, Masanobu, 4,181,390, Cl. 339-65.000.
Stanwick, Tad. Apparatus for generating rotary power in a deep-sea environment. 4,181,455, Cl. 405-232.000.
Stauffer, Donald R.; and Stuenes, Rolf, to Bethlehem Steel Corporation. Leveling bar for coke ovens. 4,181,578, Cl. 202-239.000.
Steckl, Andrew J.: *See*—
Wendt, Jerry P.; and Steckl, Andrew J., 4,181,774, Cl. 428-335.000.
Steenhorst, Johannes, to British Petroleum Company Limited, The. Sludge removal apparatus. 4,181,614, Cl. 210-221.00P.
Stefani, Giancarlo; and Fontana, Pietro, to Lonza, Ltd. Catalyst for oxidation reactions and process for its production. 4,181,628, Cl. 252-435.000.
Steiger, Roger A.; and Holden, Calvin B., to PPG Industries, Inc. Method for heating electrolytic cell. 4,181,583, Cl. 204-67.000.
Steiger, Roger A.; and Holden, Calvin B., to PPG Industries, Inc. Method for heating electrolytic cell. 4,181,584, Cl. 204-67.000.
Steinau, Peter, to Hoechst Aktiengesellschaft. Plaster board panels. 4,181,767, Cl. 428-219.000.
Steiner, Edward L.: *See*—
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.
Steinhaus, Harald: *See*—
Schmid, Jurgen; Schutte, Rolf; and Steinhaus, Harald, 4,181,508, Cl. 55-82.000.
Stelma, Gerard N., to Keeler Corporation. Sash lock. 4,181,333, Cl. 292-66.000.
Stenger, Richard E.; Ekstedt, Edward E.; and Seto, Stanford P., to General Electric Company. Combustor dome sleeve. 4,180,974, Cl. 60-39.710.
Stephenson, Warren R.: *See*—
Cumming, Richard J.; and Stephenson, Warren R., 4,181,833, Cl. 200-61.620.
Sterling Drug Inc.: *See*—
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,181,719, Cl. 424-233.000.
Sterling, John G. Strike assembly. 4,181,338, Cl. 292-341.170.
Stevens, Michael T., to Zenith Radio Corporation. Assembly of electron guns having different gamma values. 4,181,870, Cl. 313-414.000.
Stevens, William D., to Foster Wheeler Energy Corporation. Method of pulverizing. 4,181,263, Cl. 241-19.000.
Stevenson, John L.: *See*—
Dyott, Richard B.; and Stevenson, John L., 4,181,515, Cl. 65-3.00A.
Stewart-Warner Corporation: *See*—
Mayer, William R.; and Rieth, Lawrence E., 4,181,831, Cl. 200-61.250.
Stiebel Eltron GmbH & Co. KG: *See*—
Brand, Dieter; and Pape, Fritz G., 4,181,316, Cl. 280-11.200.
Stiel, Hans: *See*—
Flotow, Richard A.; and Stiel, Hans, 4,181,199, Cl. 188-72.900.
Stocker, Alberto, to Schaeffer Homberg GmbH. Fastener for bands or the like. 4,180,891, Cl. 24-206.00B.
Stoll, Kurt; and Rudle, Manfred. Pneumatic circuit arrangement. 4,181,141, Cl. 137-119.000.
Stoltz, Woodrow W. Internal pipeline cleaning device. 4,180,948, Cl. 51-411.000.
Stone, Robert D., to Ecodyne Corporation. Cooling tower fill assembly. 4,181,692, Cl. 261-111.000.
Stouffer Corporation, The: *See*—
McLaughlin, Thomas P., 4,180,987, Cl. 62-341.000.
Stowik, William J.; and Kaiser, Kenneth L., to Vollrath Company, The. Door jamb assembly. 4,180,944, Cl. 49-504.000.
Straumann, Fritz; and Sutter, Franz, to Institut Straumann AG. Implant for an artificial tooth. 4,180,910, Cl. 433-173.000.
Straw, Alan: *See*—
Dillarstone, Alan; and Straw, Alan, 4,181,623, Cl. 252-143.000.
Streich, Steven G.: *See*—
Knox, Lloyd C.; and Streich, Steven G., 4,181,454, Cl. 405-227.000.
Striebig, Ludwig. Apparatus for cutting panels to size. 4,181,054, Cl. 83-153.000.
Striker, Inc.: *See*—
Zinke, Andrew E., 4,181,492, Cl. 431-264.000.
Stritzko, Vilem, to Bleiche AG Zofingen. Method of preventing escape of dye fluid between dye beams and convoluted textile material. 4,180,880, Cl. 8-154.000.
Strom, Hans-Goran, to SAB Industri AB. Hydraulic vehicle brake system. 4,181,368, Cl. 303-15.000.
Stroobants, Alphonse; and Cvacho, Daniel S., to Belgium Tool & Die Company. Can cutting apparatus and method. 4,181,050, Cl. 82-56.000.
Strope, Daniel J., to Phillips Petroleum Company. Diolefin dimerization catalyst and method for producing nitrosyl halides of iron triad metals. 4,181,707, Cl. 423-386.000.
Stuenes, Rolf: *See*—
Stauffer, Donald R.; and Stuenes, Rolf, 4,181,578, Cl. 202-239.000.
Sturdy, Harry D., to Sturdy Truck Equipment, Inc. Governor for engine and load speeds. 4,181,103, Cl. 123-102.000.
Sturdy Truck Equipment, Inc.: *See*—
Sturdy, Harry D., 4,181,103, Cl. 123-102.000.
Subotnick, Steven I., to Brooks Shoe Manufacturing Co., Inc. Running shoe with wedged sole. 4,180,924, Cl. 36-129.000.
Sudduth, Jerome R.: *See*—
Keyworth, Donald A.; and Sudduth, Jerome R., 4,181,536, Cl. 134-2.000.
Suenaga, Noboru, to Roland Corporation. Electrical string-instrument. 4,181,058, Cl. 84-1.160.
Sugahana, Hirozo: *See*—
Nagatoshi, Kikuo; Ito, Toshimichi; Inayoshi, Akio; Sakoda, Atsunobu; Fujimoto, Noriki; Kaji, Hidehiko; and Sugahana, Hirozo, 4,181,689, Cl. 525-419.000.
Sugimoto, Atsumi: *See*—
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; and Kouyama, Toshitake, 4,181,914, Cl. 358-1.000.
Sugiura, Yoji; Tezuka, Nobuo; Yoshikawa, Ryoichi; and Masanori, Uchidoi, to Canon Kabushiki Kaisha. Shutter operation control device for a photographic camera. 4,181,417, Cl. 354-152.000.
Sumi, Masahiko, to Vlsi Technology Research Association. Radiant beam exposure method. 4,181,860, Cl. 250-492.00A.
Sumitomo Chemical Company, Limited: *See*—
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.
Yoshida, Noboru; Kiyohara, Takao; and Ogino, Shigeo, 4,181,731, Cl. 424-273.00R.

Sumitomo Electric Industries, Ltd.: *See*—
Saito, Yasunori, 4,181,486, Cl. 425-113.000.
Sun Electric Corporation: *See*—
Schapink, Walter, 4,181,016, Cl. 73-168.000.
Suntech, Inc.: *See*—
Butte, Walter A., Jr.; and Angstadt, Howard P., 4,181,680, Cl. 260-563.00D.
Surface Technology, Inc.: *See*—
Feldstein, Nathan, 4,181,760, Cl. 427-305.000.
Sutter, Franz: *See*—
Straumann, Fritz; and Sutter, Franz, 4,180,910, Cl. 433-173.000.
Sutton, Richard C.: *See*—
Blakey, Cathy L.; and Sutton, Richard C., 4,181,526, Cl. 430-67.000.
Suzuki, Kazuie: *See*—
Kobayashi, Tamotsu; Suzuki, Kazuie; and Torimaru, Takashi, 4,181,019, Cl. 73-194.0EM.
Suzuki, Ryoichi: *See*—
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Suzuki, Satoru: *See*—
Horiuchi, Goh; Yabuuchi, Seizo; Suzuki, Satoru; and Amaha, Mikio, 4,181,742, Cl. 426-12.000.
Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Processor device. 4,181,938, Cl. 364-200.000.
Suzuki, Takaai: *See*—
Toyoda, Yoshiaki; Teraji, Yoshiaki; and Suzuki, Takaai, 4,181,489, Cl. 431-11.000.
Swartz, Mitchell R., to Massachusetts Institute of Technology. Virus inactivation applicator and the like. 4,181,128, Cl. 128-207.210.
Sweeney, W. Alan, to Chevron Research Company. 2-Pyrrolidone production. 4,181,662, Cl. 260-326.5FN.
Swenson, Richard F.; Eimen, Shawn H.; Gryga, John J., Jr.; and Schommer, Gerard E., to Milsco Manufacturing Company. Seat backrest tilt and height adjustment means. 4,181,357, Cl. 297-353.000.
Swindt, Joseph K., to Ecodyne Corporation. Cooling tower fill assembly. 4,181,693, Cl. 261-111.000.
Sylogye, Michael. Screen assembly for animal litter station. 4,181,095, Cl. 119-1.000.
Synergetics, Inc.: *See*—
Clark, Ronald G., 4,181,347, Cl. 296-1.00R.
Syntex (U.S.A.) Inc.: *See*—
Marx, Michael; and Kertesz, Denis J., 4,181,720, Cl. 424-241.000.
Szasz, Peter R.; and Schulte, Harvey L., to Kasper Instruments, Inc. Wafer transfer apparatus. 4,181,214, Cl. 198-467.000.
Sze, Morgan C., to Lummus Company, The. Feed hydrotreating for improved thermal cracking. 4,181,601, Cl. 208-143.000.
Tada, Seiichi: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.
Tah-Sun, Lin. Rolling type door or window guide. 4,181,376, Cl. 308-6.00R.
Tajnai, Joseph D.; Chadwick, Curt H.; and Radecki, Dan J., to GTE Sylvania Incorporated. Laser pumping assembly. 4,181,900, Cl. 331-94.50P.
Takagi, Yasuo; and Katoh, Kazumasa, to Nissan Motor Company, Limited. Secondary air supply system using reed valves. 4,180,975, Cl. 60-290.000.
Takamatsu, Hideo; Minatono, Shobu; Terao, Katsuyoshi; and Yamauchi, Junnosuke, to Kuraray Co., Ltd. Pressure sensitive adhesive compositions. 4,181,635, Cl. 260-5.000.
Takano, Toshio, to Fuji Heavy Industries Co., Ltd. Governor valve assembly for automatic transmission units. 4,181,138, Cl. 137-54.000.
Takao, Okuno: *See*—
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, to Sumitomo Chemical Company, Limited. 1-Branched-alkylcarbonyl-3-(3,5-dihalophenyl)imidazolidine-2,4-diones. 4,181,732, Cl. 424-273.00R.
Takeda Chemical Industries, Ltd.: *See*—
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, 4,181,610, Cl. 210-85.000.
Takeda, Hitoshi: *See*—
Onishi, Hisao; Numazawa, Ryozo; and Takeda, Hitoshi, 4,181,604, Cl. 210-8.000.
Takeharu, Ohumi: *See*—
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.
Takemoto, Yasunori; Asanomi, Koji; and Kobayashi, Kazuo, to Toyo Kogyo Co., Ltd. Ignition timing control for internal combustion engine having a dual induction type intake system. 4,181,105, Cl. 123-117.00A.
Takeno, Hidekazu: *See*—
Kamiya, Takashi; Hashimoto, Masashi; Nakaguti, Osamu; Oku, Teruo; Nakai, Yoshiharu; and Takeno, Hidekazu, 4,181,800, Cl. 544-180.000.
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, to Janome Sewing Machine Co., Ltd. Pattern selecting system for sewing machine. 4,181,086, Cl. 112-158.00F.
Takeshita, Kunio: *See*—
Shirota, Yasushi; Kishimoto, Satoru; Takeshita, Kunio; and Ando, Yoshio, 4,181,430, Cl. 356-1.000.
Takeuchi, Mitsuharu; Hayashi, Satoshi; and Minemoto, Isao, to Lion Hamigaki Kabushiki Kaisha; and Takeuchi, Mitsuharu. α-Cyanoacrylate dental material and method of preparation. 4,180,913, Cl. 433-228.000.
Takeuchi, Naoki: *See*—
Sano, Tsutomu; Takeuchi, Naoki; Kurumaji, Masanobu; and Nakatsukasa, Susumu, 4,181,510, Cl. 55-183.000.
Talbott, Charles F., Jr., to Hughes Aircraft Company. Nodal/modal control and power intensification methods and apparatus for vibration testing. 4,181,027, Cl. 73-665.000.
Talbott, Charles F., Jr., to Hughes Aircraft Company. Multi-axis, complex mode pneumatically actuated plate/space frame shaker for quasi-random pneumatic vibration facility. 4,181,028, Cl. 73-665.000.
Talbott, Charles F., Jr., to Hughes Aircraft Company. Multi-axis, complex mode pneumatically actuated annular frame shaker for quasi-random pneumatic vibration facility. 4,181,029, Cl. 73-665.000.
Talbott, Charles F., Jr.: *See*—
Abstein, Henry T., Jr.; Page, Dennis B.; Kallis, James M.; Talbott, Charles F., Jr.; and Baker, Richard L., 4,181,026, Cl. 73-665.000.
Tanabe, Tomio; and Nishiwaki, Muneo, to Mitsubishi Denki Kabushiki Kaisha. AC elevator speed control system. 4,181,197, Cl. 187-29.00R.
Tanaka, Haruhiko: *See*—
Kato, Kenji; and Tanaka, Haruhiko, 4,181,876, Cl. 318-345.00G.
Tateishi, Iwao, to Sharp Kabushiki Kaisha. Stored information transferable means for a combined electronic digital scale and calculator. 4,181,959, Cl. 364-562.000.
Tateishi, Iwao; and Kakutani, Nobuyasu, to Sharp Kabushiki Kaisha. Tape reel and detector assembly for an electronic combined digital scale and calculator. 4,181,960, Cl. 364-562.000.
Tatsumi, Toshio; Otani, Tadashi; and Yamazi, Masami, to Matsushita Electric Industrial Co., Ltd. Ceramic trimmer capacitor. 4,181,923, Cl. 361-293.000.
Taylor, Robert E.; and Lee, Paul J., to W. N. Phillips, Inc. Harmonic distortion attenuator. 4,181,921, Cl. 361-56.000.
TDK Electronics Company, Limited: *See*—
Shiba, Haruo; and Okamura, Masatoshi, 4,181,272, Cl. 242-74.100.
Teass, Jr., Horace A. Linear ground conductivity measuring system. 4,181,880, Cl. 324-439.000.
Technology Application Services Corp.: *See*—
Camacho, Salvador L., 4,181,504, Cl. 48-197.00R.
Tektronix, Inc.: *See*—
Holland, Kenneth C.; Reed, Gary W.; and Murphy, Desmond L., 4,181,903, Cl. 333-81.00R.
Telefonaktiebolaget L M Ericsson: *See*—
Lundberg, Bo E. O.; and Scuka, Viktor, 4,181,815, Cl. 174-101.500.
Tennant, Walter. Portable gun display. 4,181,221, Cl. 206-317.000.
Tenneco Chemicals, Inc.: *See*—
Keyworth, Donald A.; and Sudduth, Jerome R., 4,181,536, Cl. 134-2.000.
Teo, Boon K., to Bell Telephone Laboratories, Incorporated. Cell using halogen reactive material such as organo-metallic polymer. 4,181,779, Cl. 429-199.000.
Teraji, Yoshiaki: *See*—
Toyoda, Yoshiaki; Teraji, Yoshiaki; and Suzuki, Takaai, 4,181,489, Cl. 431-11.000.
Terao, Katsuyoshi: *See*—
Takamatsu, Hideo; Minatono, Shobu; Terao, Katsuyoshi; and Yamauchi, Junnosuke, 4,181,635, Cl. 260-5.000.
Tetcu, Ion: *See*—
Moraru, Dinu S.; Tetcu, Ion; and Mihaescu, Constantin, 4,180,953, Cl. 52-169.140.
Texaco Development Corp.: *See*—
Watts, Lewis W., Jr.; and Waddill, Harold G., 4,181,682, Cl. 260-584.00B.
Texaco Inc.: *See*—
Frazier, Gregory D., 4,181,176, Cl. 166-252.000.
Texas Instruments Incorporated: *See*—
Kulwicki, Bernard M., 4,180,901, Cl. 29-621.000.
Moore, James H.; and Lee, Gene D., 4,181,964, Cl. 364-708.000.
Texas Medical Products, Inc.: *See*—
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,180,896, Cl. 29-157.00R.
Textron, Inc.: *See*—
Elbaum, Bernard M.; and Harvey, Engel, 4,180,921, Cl. 35-59.000.
Teys, Raymond W.: *See*—
Zuvela, Bernard R.; Teys, Raymond W.; and Johnson, Richard A., 4,181,014, Cl. 73-151.000.
Tezuka, Nobuo: *See*—
Sugiura, Yoji; Tezuka, Nobuo; Yoshikawa, Ryoichi; and Masanori, Uchidoi, 4,181,417, Cl. 354-152.000.
Thetford Corporation: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Hoffman, John A.; and Lindsay, Erin J., 4,180,876, Cl. 4-321.000.
Thievessen, Karl: *See*—
Buschmann, Gerhard; Thievessen, Karl; Weiss, Peter; and Reitter, Werner, 4,181,847, Cl. 235-92.0CC.
Thomas, Robert W.; and Hovanic, Steven F., to Arrow-Hart, Inc. Mating circuit breakers with bus clip receiving zone and communicating arcuate groove. 4,181,924, Cl. 361-353.000.
Thomson - CSF: *See*—
Vasseur, Jean-Pierre, 4,181,816, Cl. 178-22.000.
Thoren, Laurence R. Push release door opener. 4,181,335, Cl. 292-92.000.

Thornburg, David D., to Xerox Corporation. Resistive electrode amorphous semiconductor negative resistance device. 4,181,913, Cl. 357-2.000.
Thornton, Donald I.; and Peyton, Richard H., to Fram Corporation. Windshield wiper. 4,180,885, Cl. 15-250.320.
Tillson, Thomas W., to Shelvoke and Drewry Limited. Refuse vehicle loading apparatus. 4,181,464, Cl. 414-501.000.
Tkach, Khaim B.: *See—*
Kostylev, Alexandr D.; Gurkov, Konstantin S.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Rozhkov, Leonid G.; Grigoraschenko, Vladimir A.; Filippov, Vasily V.; Lipovetsky, Lazar M.; Ardyshev, Valentin N.; and Tkach, Khaim B., 4,181,484, Cl. 425-59.000.
Toda, Soichiro: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 4,181,797, Cl. 536-10.000.
Toda, Tokuzo, to Kabushiki Kaisha Tokyo Bebi. Baby carriage. 4,181,317, Cl. 280-42.000.
Toda, Yuzo; Mukunoki, Yasuo; and Koizumi, Junji, to Fuji Photo Film Co., Ltd. Photographic material comprising organic solvent gelling agent. 4,181,527, Cl. 430-543.000.
Tokai Seiki Co., Ltd.: *See—*
Nitta, Tomio, 4,181,490, Cl. 431-129.000.
Tokico Ltd.: *See—*
Nagase, Toshiro, 4,180,888, Cl. 16-58.000.
Tokunaga, Ikuo; Uchiyama, Hideaki; and Fujimori, Yoshiaki, to Kabushiki Kaisha Suwa Seikosha. Wristwatch with sound-making device. 4,180,970, Cl. 58-57.500.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Kohyama, Susumu, 4,181,865, Cl. 307-361.000.
Kunii, Yutaka; and Shimoji, Toshikuni, 4,181,120, Cl. 128-660.000.
Miyoshi, Katsuhiko, 4,181,857, Cl. 250-402.000.
Suzuki, Seigo; and Eguchi, Seiji, 4,181,938, Cl. 364-200.000.
Tomita, Koji: *See—*
Kawaguchi, Hiroshi; Tsukiura, Hiroshi; and Tomita, Koji, 4,181,574, Cl. 435-77.000.
Topsoe, Haldor F. A.; and Gam, Erik A., to Haldor Topsoe A/S. Apparatus and process for the synthesis of ammonia. 4,181,701, Cl. 422-158.000.
Torimaru, Takashi: *See—*
Kobayashi, Tamotsu; Suzuki, Kazuie; and Torimaru, Takashi, 4,181,019, Cl. 73-194.0EM.
Toshiro, Harada: *See—*
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.
Totten, Clyde D. Weather resistant structure and method of making. 4,181,764, Cl. 428-155.000.
Toy, Henry: *See—*
Bernstein, Phillip; and Toy, Henry, 4,181,062, Cl. 89-1.50F.
Toyo Kogyo Co., Ltd.: *See—*
Takemoto, Yasunori; Asanomi, Koji; and Kobayashi, Kazuo, 4,181,105, Cl. 123-117.00A.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Matsushita, Susumu; and Ikushige, Tetsuo, 4,181,649, Cl. 260-112.50R.
Toyobo Co., Ltd.: *See—*
Fukuda, Takashi; Shimada, Masayoshi; Ishizaki, Nobuo; and Iwahori, Shoichi, 4,181,513, Cl. 55-316.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.
Toyoda, Yoshiaki; Teraji, Yoshiaki; and Suzuki, Takaai, to Mitsui Toatsu Chemicals, Incorporated. Process for the treatment of by-products obtained in the preparation of phthalic anhydride. 4,181,489, Cl. 431-11.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,181,147, Cl. 137-572.000.
Ito, Atsuhiko, 4,181,204, Cl. 192-4.00A.
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,181,110, Cl. 123-119.00A.
Kyonomine, Masaru, 4,181,834, Cl. 200-61.890.
Noeami, Tomoyuki; and Hayashi, Hideyuki, 4,181,370, Cl. 303-24.00F.
Sanada, Masakatsu; and Nakada, Masahiko, 4,181,111, Cl. 123-133.000.
Shinoda, Kazuo, 4,181,104, Cl. 123-102.000.
Souma, Teruo, 4,181,200, Cl. 188-73.500.
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.
Trail, Lloyd G. Apparatus for servicing a bird cage. 4,181,612, Cl. 210-169.000.
Trajtenberg, Aaron; and Ghibaudi, Ana M. Railway brake shoe with removable flange. 4,181,202, Cl. 188-252.000.
Tredwell, Gilman, to George Koch Sons, Inc. Spraying system with improved exhaust. 4,181,093, Cl. 118-323.000.
Tresch, Erwin; and Horvath, Zoltan, to Cerberus AG. Smoke detector with a conical ring-shaped radiation region. 4,181,439, Cl. 356-338.000.
Tricerri Zumin, Silvia; and Bianchetti, Alberto, to Pierrel S.p.A. Indolyl acetic acid derivative. 4,181,740, Cl. 424-274.000.
Trickett, Elizabeth A.: *See—*
McKinzie, Howard; and Trickett, Elizabeth A., 4,181,593, Cl. 204-290.00F.
McKinzie, Howard; and Trickett, Elizabeth A., 4,181,754, Cl. 427-74.000.
True Temper Corporation: *See—*
Ramsay, John M., 4,181,165, Cl. 144-325.000.
TRW Inc.: *See—*
Rau, Jim L.; and Kinder, Mark R., 4,181,042, Cl. 74-750.00R.
TRW Inc. Systems & Energy: *See—*
Rizzo, Anthony A., 4,181,283, Cl. 248-550.000.
Tseng, Samuel C., to International Business Machines Corporation. Complex character generator. 4,181,973, Cl. 364-900.000.
Tsuboi, Akira: *See—*
Nishimura, Hideo; Nomura, Kenji; Ohkoshi, Fumihiko; Tsuboi, Akira; Kamiya, Yoji; Eguchi, Kazuo; and Nakashima, Kunimichi, 4,181,211, Cl. 198-339.000.
Tsubuko, Kazuo, to Ricoh Co., Ltd. Liquid developer for use in electrophotography. 4,181,620, Cl. 430-114.000.
Tsuchimoto, Takamitsu: *See—*
Hattori, Akira; and Tsuchimoto, Takamitsu, 4,181,937, Cl. 364-200.000.
Tsuji, Jiro, to Mitsubishi Petrochemical Co., Ltd. 1,7-Octadien-3-one and process for preparing the same. 4,181,683, Cl. 260-593.00R.
Tsukiura, Hiroshi: *See—*
Kawaguchi, Hiroshi; Tsukiura, Hiroshi; and Tomita, Koji, 4,181,574, Cl. 435-77.000.
Tsunekawa, Tokuichi: *See—*
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, 4,181,415, Cl. 354-86.000.
Tubb, Thomas L., Jr.: *See—*
Bitting, James L.; and Tubb, Thomas L., Jr., 4,181,047, Cl. 81-9.510.
Tutihasi, Simpei: *See—*
Chu, Joseph Y. C.; Schank, Richard L.; and Tutihasi, Simpei, 4,181,772, Cl. 430-58.000.
U C B, Societe Anonyme: *See—*
Heiremans, Robert; and Depuydt, Andre, 4,181,239, Cl. 220-461.000.
Ubukata, Morio; and Kida, Hideki, to Alps Shoji Co., Ltd. Arraagement toy for signalling proper arrangement of elements. 4,180,920, Cl. 35-9.00D.
Uchimoto, Iwahiro: *See—*
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, 4,181,565, Cl. 162-76.000.
Uchiyama, Hideaki: *See—*
Tokunaga, Ikuo; Uchiyama, Hideaki; and Fujimori, Yoshiaki, 4,180,970, Cl. 58-57.500.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Ito, Fumio; Matsuda, Mutsuhide; and Furukawa, Hiroshi, to Canon Kabushiki Kaisha. Camera. 4,181,415, Cl. 354-86.000.
Uchiyama, Takashi: *See—*
Ito, Fumio; Matsuda, Mutsuhide; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Uchiyama, Takashi; and Furukawa, Hiroshi, 4,181,414, Cl. 354-83.000.
Ueda, Ikuo: *See—*
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, 4,181,228, Cl. 209-552.000.
Ueda, Kazuo, to Ueda Works Co., Ltd. Device for measuring blood pressure. 4,181,122, Cl. 128-680.000.
Ueda, Takeo, to NSK-Warner K.K. Buckle apparatus for safety belt. 4,181,832, Cl. 200-61.58B.
Ueda Works Co., Ltd.: *See—*
Ueda, Kazuo, 4,181,122, Cl. 128-680.000.
Ueno, Zene: *See—*
Yamane, Kimitaka; Morita, Akira; and Ueno, Zene, 4,181,100, Cl. 123-32.0ST.
UHDE GmbH: *See—*
Wengeler, Wilhelm; Wolstein, Friedrich; and Hoffmann, Egbert, 4,181,703, Cl. 423-167.000.
Ullrich, Martin: *See—*
Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, 4,181,788, Cl. 526-68.000.
Umeda, Tadashi: *See—*
Okada, Tetuya; Umeda, Tadashi; Murakami, Masahiro; and Aizawa, Tatsuo, 4,181,424, Cl. 355-8.000.
Umweltforschung mbH: *See—*
Niemann, Ernst-Georg; and Georgi, Bernd, 4,181,442, Cl. 356-417.000.
Underwood, Thomas E.; and Holden, James J., III, to Westinghouse Electric Corp. Multiprocessor for providing fault isolation test upon itself. 4,181,940, Cl. 364-200.000.
Union Carbide Corporation: *See—*
D'Silva, Themistocles D. J., 4,181,734, Cl. 424-285.000.
Lyons, Francis T., 4,181,939, Cl. 364-200.000.
Ward, Robert J.; Kawakami, James H.; and McCarthy, Neil J., Jr., 4,181,687, Cl. 525-100.000.
Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 4,180,927, Cl. 37-190.000.
United Kingdom Atomic Energy Authority: *See—*
Ingham, Robert V., 4,181,569, Cl. 176-36.00R.
Jolly, Robert, 4,181,571, Cl. 176-40.000.
Woodhead, James L., 4,181,532, Cl. 106-40.00R.
United States of America
Air Force: *See—*

Evers, Robert C.; and Moore, George J., 4,181,681, Cl. 260-575.000.
Fujishiro, Shiro; and Eylon, Daniel, 4,181,590, Cl. 204-192.00N.
Psarras, Theodore, 4,181,678, Cl. 260-544.00F.
Psarras, Theodore, 4,181,679, Cl. 260-544.00F.
Wendt, Jerry P.; and Steckl, Andrew J., 4,181,774, Cl. 428-335.000.
Williamson, Tommy L.; and Rose, Harold W., 4,181,435, Cl. 356-141.000.

Army: *See—*
Allen, William A.; and Chen, Pi-Fuay, 4,181,851, Cl. 250-203.00R.
Johnson, Richard N., 4,181,968, Cl. 364-728.000.

Energy: *See—*
Isaacs, Hugh S.; and Weeks, John R., 4,181,882, Cl. 324-71.00R.
Narayan, Jagdish; White, Clark W.; and Young, Rosa T., 4,181,538, Cl. 148-1.500.
Wade, Elman E., 4,181,572, Cl. 176-87.000.
Weitl, Frederick L.; and Raymond, Kenneth N., 4,181,654, Cl. 260-239.0BC.

Interior: *See—*
Baglin, Elizabeth G.; Atkinson, Gary B.; and Nicks, Larry J., 4,181,630, Cl. 252-476.000.
Schiller, Joseph E.; and Khalafalla, Sanaa E., 4,181,607, Cl. 210-36.000.
Wong, Morton M.; and Haver, Frank P., 4,181,588, Cl. 204-115.000.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brooks, Donald E. Method for separating biological cells. 4,181,589, Cl. 204-180.00R.
Schindler, Rudolf A. Over-under double-pass interferometer. 4,181,440, Cl. 356-346.000.

Navy: *See—*
Beezley, Dale L., 4,181,931, Cl. 363-4.000.
Bernstein, Phillip; and Toy, Henry, 4,181,062, Cl. 89-1.50F.
Dilley, Douglas M., 4,181,892, Cl. 325-474.000.
Martini, Leonard J., 4,181,139, Cl. 137-68.00A.
Nicoloff, Nicholas, 4,181,152, Cl. 137-637.100.
Weller, Joseph F.; Crowley, James D.; and Giallorenzi, Thomas G., 4,181,904, Cl. 333-153.000.
West, Gaylon L.; and Boyle, John M., 4,181,879, Cl. 324-326.000.
West, James C., Jr.; and Shreeve, Raymond P., 4,181,962, Cl. 364-565.000.

U.S. Philips Corporation: *See—*
Chermin, Hubertus M. J., 4,181,872, Cl. 315-106.000.
Mewissen, Jan A. C.; and Van Beek, Ferdinandus M. J., 4,181,930, Cl. 362-296.000.
Wesselink, Gustaaf A.; Franken, Adrianus J. J.; and Smulders, Hendricus F. G., 4,181,155, Cl. 138-30.000.

United States Steel Corporation: *See—*
Price, Charles A., 4,181,459, Cl. 414-161.000.
Pringle, William L., 4,181,173, Cl. 165-169.000.

United Technologies Corporation: *See—*
Anderson, William S., 4,181,545, Cl. 149-19.900.
Lesieur, Roger R.; Setzer, Herbert J.; and Hawkins, James R., 4,181,503, Cl. 48-196.00A.

Universal Towel Company Limited: *See—*
Lemon, Maurice C.; and Spear, John F., 4,180,994, Cl. 68-18.00F.

Universall Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG: *See—*
Schieber, Hans; Krause Erich both of; and Schimko, Reinhold, 4,180,992, Cl. 66-75.100.

University of Akron, The: *See—*
Frey, Richard C.; Railey, Malcolm R.; and Wargo, Thomas J., 4,181,971, Cl. 364-900.000.

University of Michigan, The Regents of the: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,181,725, Cl. 424-258.000.

University of Pittsburgh: *See—*
Rizk, Nabil I.; and Valentich, Frank, 4,181,594, Cl. 204-299.00R.

University of Virginia Alumni Patents Foundation, The: *See—*
Crosby, Ivan K., 4,181,123, Cl. 128-6.000.

Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Indicator device used in camera to indicate exposure values within a finder. 4,181,411, Cl. 354-53.000.

Untz, Robert W.: *See—*
Grawey, Charles E.; Untz, Robert W.; and Koch, Keith E., 4,181,169, Cl. 152-404.000.

Upjohn Company, The: *See—*
Hall, Charles M.; and Johnson, Herbert G., 4,181,724, Cl. 424-250.000.
Johnson, Roy A., 4,181,808, Cl. 560-121.000.
McCall, John M., 4,181,665, Cl. 260-340.50R.
Morton, Douglas R., Jr., 4,181,798, Cl. 542-426.000.

Urano, Fumio: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,181,411, Cl. 354-53.000.

Ushiyama, Keiichi: *See—*
Mune, Isao; Ushiyama, Keiichi; Saito, Kenitiro; Moroishi, Yutaka; and Nakao, Tadaichi, 4,181,786, Cl. 525-327.000.

Vache, Jean-Claude, to Sea Tank Co. Apparatus for positioning an off-shore weight structure on a previously positioned sea bed unit. 4,181,453, Cl. 405-203.000.

Vairon, Jean-Pierre: *See—*
Sigwalt, Pierre; Guyot, Patrick; Fontanille, Michel; and Vairon, Jean-Pierre, 4,181,684, Cl. 585-25.000.

Valentich, Frank: *See—*
Rizk, Nabil I.; and Valentich, Frank, 4,181,594, Cl. 204-299.00R.

Valeron Corporation, The: *See—*
Juengel, Richard O.; and Cook, Kenneth J., 4,181,958, Cl. 364-560.000.

Van Beek, Ferdinandus M. J.: *See—*
Mewissen, Jan A. C.; and Van Beek, Ferdinandus M. J., 4,181,930, Cl. 362-296.000.

Vanderford, William D.: *See—*
Keller, Wilbur S.; and Vanderford, William D., 4,181,185, Cl. 175-229.000.

van der Lely, Cornelis. Soil cultivating machines. 4,181,180, Cl. 172-50.000.

van der Lely, Cornelis. Articulated agricultural tractors with two engines in tandem and a high capacity fuel tank. 4,181,315, Cl. 280-5.00A.

Vanderlyn, Donald. Anchoring system. 4,180,952, Cl. 52-148.000.

Vandervell Products Limited: *See—*
Spikes, Roger H.; and Blackburn, William J. G., 4,180,895, Cl. 29-149.50C.

Van Doren, David A. Reinforced plastic mold for concrete panels. 4,181,286, Cl. 249-82.000.

Vangedal-Nielsen, Erling. Freezing mould bag. 4,181,285, Cl. 249-61.000.

Van Lukas, Stephen: *See—*
Welsh, Paul B.; and Van Lukas, Stephen, 4,181,613, Cl. 210-179.000.

Van Niel, Paul R.: *See—*
Kenyon, John W.; Shockley, Lestle R.; and Van Niel, Paul R., 4,181,237, Cl. 220-71.000.

Vannini, Paolo; Rivetti, Enrico; and Bertone, Antonino, to Fiat Societa per Azioni. Hydraulic actuator for a motor vehicle anti-skid braking system. 4,181,373, Cl. 303-116.000.

van Oene, Henk: *See—*
Chattha, Mohinder S.; Beckwith, Elaine C. S.; and van Oene, Henk, 4,181,784, Cl. 525-161.000.
Chattha, Mohinder S.; Siwiec Beckwith, Elaine C.; and van Oene, Henk, 4,181,785, Cl. 525-161.000.

Van Veelen, George F.: *See—*
Sels, Francis J.; Kokelenberg, Hendrik E.; and Van Veelen, George F., 4,181,529, Cl. 430-626.000.

Van Vleet, Gary R.: *See—*
Carlson, Richard C.; and Van Vleet, Gary R., 4,181,125, Cl. 128-75.000.

Van Voorhis, David C., to International Business Machines Corporation. Random access bubble memory with unified read/write cycle. 4,181,977, Cl. 365-4.000.

Varian Associates, Inc.: *See—*
Abu-Shumays, Ahmad; and Johnson, Edward L., 4,181,853, Cl. 250-304.000.

Vasseur, Jean-Pierre, to Thomson - CSF. Devices for combining random sequences, using one or more switching operations. 4,181,816, Cl. 178-22.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Craze-resistant polysiloxane resin coatings and coating compositions containing a discontinuous phase. 4,181,686, Cl. 525-474.000.

Vaughn, Walter L.; and Allen, James A., to Dow Chemical Company, The. Cellulosic materials internally sized with ammoniated acid copolymers and epihalohydrin/alkylamine reaction products. 4,181,566, Cl. 162-164.0EP.

VEB Chemiewerk Nunchritz: *See—*
Schumann, Hiltraut; and Dathe, Christian, 4,181,673, Cl. 260-448.20T.

Vedvig, Matt. Tobacco harvester. 4,180,965, Cl. 56-27.500.

Venture Ride Mfg. Inc.: *See—*
Barber, Gerald L.; and Comstock, Wayne, 4,181,929, Cl. 362-192.000.

Verdicchio, Robert J.: *See—*
Kennedy, Robert R.; Lindemann, Martin K. O.; and Verdicchio, Robert J., 4,181,634, Cl. 252-545.000.

Veronesi, Luciano; and Francis, Woodie R., to Westinghouse Electric Corp. Nuclear reactor coolant pump having a tooling boom. 4,181,471, Cl. 417-360.000.

Vibramec S.A.R.L.: *See—*
Bernicot, Jean B., 4,181,461, Cl. 414-412.000.

Vide et Traitement S.A.: *See—*
LeFrancois, Philippe, 4,181,541, Cl. 148-16.600.

Vidrio, Horacio: *See—*
Havera, Herbert J.; Vidrio, Horacio; and Johnson, Richard D., 4,181,657, Cl. 424-256.000.

Vinel, Rene; Querton, Jean-Pierre; and Serville, Claude, to SKF Compagnie d'Applications Mechaniques. Self aligning clutch release bearing. 4,181,380, Cl. 308-233.000.

Vitalini, Pier Luigi. Reticle device applicable to flexible radiographic films. 4,181,859, Cl. 250-476.000.

Vlsi Technology Research Association: *See—*
Sumi, Masahiko, 4,181,860, Cl. 250-492.00A.

Volkswagenwerk Aktiengesellschaft: *See—*
Danckert, Hermann, 4,181,192, Cl. 180-232.000.
Neumann, Joachim, 4,181,332, Cl. 285-334.400.

Voll, Gerhard W.: *See—*
Weiher, Richard L.; Voll, Gerhard W.; and Hagemark, Kjell I., 4,181,627, Cl. 252-301.60R.

Vollbrecht, Rolf: *See—*
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, 4,181,450, Cl. 405-19.000.

Vollrath Company, The: *See—*
Stowik, William J.; and Kaiser, Kenneth L., 4,180,944, Cl. 49-504.000.

von Hoerschelmann, Detlef: *See—*
Gruber, Wolfgang; Lang, Gunter; Nelboeck-Hochstetter, Michael; Roeschlau, Peter; Seidel, Hans; and von Hoerschelmann, Detlef, 4,181,575, Cl. 435-11.000.

Von Schanefelt, Robert: *See—*
Kickle, Hunter L.; Ball, William J., Jr.; and Von Schanefelt, Robert, 4,181,747, Cl. 426-615.000.

Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., to University of Michigan, The Regents of the. Method for alleviating psoriasis. 4,181,725, Cl. 424-258.000.

Vorwerk & Co. Interholding GmbH: *See—*
Wudel, Egon; and Haase, Georg, 4,180,887, Cl. 15-415.00R.

Vyzkumny ustav tvarecich stroju a technologie tvareni: *See—*
Zalesak, Jan; and Bednar, Miloslav, 4,181,001, Cl. 72-108.000.

W. N. Phillips, Inc.: *See—*
Taylor, Robert E.; and Lee, Paul J., 4,181,921, Cl. 361-56.000.

W. R. Grace & Co.: *See—*
Popper, Felix B.; McCarthy, Jeremiah B.; and Hart, James R., 4,181,672, Cl. 260-429.00J.
Reppert, Merlyn R., 4,181,364, Cl. 301-8.000.

Wada, Norikazu, to Honeywell Inc. Electrodes for an electromagnetic flow meter. 4,181,013, Cl. 73-194.0EM.

Wada, Yoshikazu: *See—*
Shintani, Motoaki; Wada, Yoshikazu; Nakamachi, Hideo; Nishikawa, Masao; and Ouchida, Akira, 4,181,610, Cl. 210-85.000.

Waddill, Harold G.: *See—*
Watts, Lewis W., Jr.; and Waddill, Harold G., 4,181,682, Cl. 260-584.00B.

Waddington, Clive, to Avco Corporation. Stepless variable stroke drive having a non-rotating cam. 4,181,043, Cl. 74-750.00B.

Wade, Elman E., to United States of America, Energy. Closure head for a nuclear reactor. 4,181,572, Cl. 176-87.000.

Wagner, Daryl A.: *See—*
Wagner, William; and Wagner, Daryl A., 4,181,032, Cl. 74-99.00R.

Wagner, Eugene R.; and Renzi, Alfred A., to Dow Chemical Company, The. 4-((3-Methoxyphenyl)amino)benzoic acid, a method for treating hyperlipidemia, and compositions thereof. 4,181,737, Cl. 424-319.000.

Wagner, Kuno: *See—*
Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,181,782, Cl. 521-162.000.

Wagner, William; and Wagner, Daryl A. Steering gear. 4,181,032, Cl. 74-99.00R.

Wahl, Josef: *See—*
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, 4,181,112, Cl. 123-148.00E.

Wake, Junichi; and Matsuda, Hiroshi, to Nissan Diesel Kogyo Company, Ltd. Exhaust gas recirculation apparatus. 4,181,109, Cl. 123-119.00A.

Wake, Ryousuke: *See—*
Kitayama, Minoru; Saito, Takao; and Wake, Ryousuke, 4,181,580, Cl. 204-28.000.

Walden, Jack M.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.

Walker, Robin A.: *See—*
Hillier, Edward F. H. B.; and Walker, Robin A., 4,181,313, Cl. 277-166.000.

Wallace Murray Corp.: *See—*
Owen, Bruce R., 4,181,466, Cl. 415-204.000.

Walter Eckold Vorrichtungs u. Geratebau Sperrluttertal: *See—*
Eckhold, Gerd-Jurgen; and Maass, Hans, 4,181,002, Cl. 72-387.000.

Walter, Lothar: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,181,374, Cl. 308-6.00C.
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,181,375, Cl. 308-6.00C.

Walters, Jay A., to Western Electric Company, Inc. Interconnect sockets and assemblies. 4,181,387, Cl. 339-17.00C.

Walters, Robert A.: *See—*
Kolenik, Steve A.; and Walters, Robert A., 4,181,133, Cl. 128-419.0PG.

Wandel, Dietmar: *See—*
Koschinek, Gunter; and Wandel, Dietmar, 4,181,697, Cl. 264-176.00F.

Ward, Andrew L. Seat belt anchorage assemblies. 4,181,359, Cl. 297-468.000.

Ward, Lowell G., to Allied Chemical Corporation. Method of producing stamped plastic articles. 4,181,551, Cl. 156-199.000.

Ward, Robert J.; Kawakami, James H.; and McCarthy, Neil J., Jr., to Union Carbide Corporation. Bonding thermoplastic resins. 4,181,687, Cl. 525-100.000.

Ward, William J., III: *See—*
Keese, Charles R.; Giaever, Ivar; and Ward, William J., III, 4,181,501, Cl. 23-230.00B.

Wardlaw, Stephen C.; Massey, James V., III; and Levine, Robert A. Blood constituents testing method. 4,181,609, Cl. 210-72.000.

Wargo, Thomas J.: *See—*
Frey, Richard C.; Railey, Malcolm R.; and Wargo, Thomas J., 4,181,971, Cl. 364-900.000.

Waring, Ian M.: *See—*
Riddell, Martin C.; and Waring, Ian M., 4,181,567, Cl. 162-168.0NA.

Warman, Robert E.; and Dusseau, Cortland R. Television receiver projection system. 4,181,918, Cl. 358-237.000.

Warren, Bernard J.; and Gagnon, Peter R., to GTE Sylvania Incorporated. Tungsten halogen lamp in reflector envelope. 4,181,869, Cl. 313-315.000.

Wasmund, Heiko; and Klein, Walter, to Ernst Leitz Wetzlar GmbH. Microscope scanning accessory for a photometer. 4,181,436, Cl. 356-225.000.

Wasmuth, Edward H.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,181,713, Cl. 424-86.000.

Wasserman, George; and Bushee, Joseph J., to Wasserman, George. Pressurizing and controlling fluid flow to a sealed article. 4,180,960, Cl. 53-403.000.

Wassmuth, Gerd: *See—*
Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, 4,181,788, Cl. 526-68.000.

Watanabe, Hiroshi: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.

Watanabe, Kazuo: *See—*
Takenoya, Hideaki; Watanabe, Kazuo; Kume, Toshiaki; Makabe, Hachiro; and Nakagawa, Tamotsu, 4,181,086, Cl. 112-158.00F.

Watanabe, Tadakazu: *See—*
Misato, Tomomasa; Ko, Keido; Adachi, Yumiko; and Watanabe, Tadakazu, 4,181,714, Cl. 424-117.000.

Watanabe, Tetsuro: *See—*
Kondo, Yasumitsu; Shomura, Takashi; Watanabe, Hiroshi; Watanabe, Tetsuro; Inouye, Shigeharu; and Niida, Taro, 4,181,715, Cl. 424-122.000.

Watson, Clyde D., to FMC Corporation. Apparatus for controlled chlorination of water with an alkali metal dichloroisocyanurate. 4,181,702, Cl. 422-265.000.

Watson, Robert E.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.

Watts, Lewis W., Jr.; and Waddill, Harold G., to Texaco Development Corp. Aminated propoxylated polybutanediols. 4,181,682, Cl. 260-584.00B.

Weber, Christopher M., to CBS Inc. Circuit for simulating sound of wire brush rotated around head of snare drum. 4,181,059, Cl. 84-1.240.

Weber, Heinrich; Dungs, Horst; and Beckmann, Franz, to Carl Still, Firma; and Eschweiler Bergwerksverein. Method of producing form coke. 4,181,502, Cl. 44-10.00C.

Weber, John R., to Caterpillar Tractor Co. Seal life in rotary mechanisms. 4,181,478, Cl. 418-51.000.

Weber, Roy. Pollution reduction smokeless auto incinerator. 4,181,081, Cl. 110-212.000.

Webster, Jady. Electrical animal snare. 4,180,937, Cl. 43-87.000.

Weeks, John R.: *See—*
Isaacs, Hugh S.; and Weeks, John R., 4,181,882, Cl. 324-71.00R.

Wegmann, Jerome B.: *See—*
Kitchen, Clarence E.; and Wegmann, Jerome B., 4,181,066, Cl. 91-306.000.

Weiher, Richard L.; Voll, Gerhard W.; and Hagemark, Kjell I., to Minnesota Mining and Manufacturing Company. High fluorescent efficiency zinc oxide crystals and method of making same. 4,181,627, Cl. 252-301.60R.

Weinberger, Paul A.: *See—*
Boyajian, John D.; and Weinberger, Paul A., 4,181,570, Cl. 176-38.000.

Weinert & Co., Firma: *See—*
Weinert, Franz, 4,181,226, Cl. 206-519.000.

Weinert, Franz, to Weinert & Co., Firma. Plastic bucket. 4,181,226, Cl. 206-519.000.

Weingarten, Joseph L. Laminated plastic packaging material. 4,181,548, Cl. 156-145.000.

Weisenborn, Frank L.: *See—*
Haugwitz, Rudiger D.; and Weisenborn, Frank L., 4,181,663, Cl. 260-326.250.

Weisner, Horst, to Machinenfabrik Korfmann GmbH. Power control of a stone cutting machine having cutting chains. 4,181,115, Cl. 125-21.000.

Weiss, Peter: *See—*
Buschmann, Gerhard; Thievessen, Karl; Weiss, Peter; and Reitter, Werner, 4,181,847, Cl. 235-92.0CC.

Weissel, Oskar: *See—*
Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, 4,181,810, Cl. 568-807.000.

Weitl, Frederick L.; and Raymond, Kenneth N., to United States of America, Energy. 2,3-Dihydroxybenzoic acid amids of tetraazaalkanes and tetaaza cycloalkanes. 4,181,654, Cl. 260-239.0BC.

Wellborn, Walter H., Jr. Trailer hitch protector. 4,181,320, Cl. 280-507.000.

Weller, Joseph F.; Crowley, James D.; and Giallorenzi, Thomas G., to United States of America, Navy. Acoustic-wave convolvers utilizing

diffused waveguides and beam compression techniques. 4,181,904, Cl. 333-153.000.

Welsh, Paul B.; and Van Lukas, Stephen, to Hewlett-Packard Company. Venting method for a chromatograph oven. 4,181,613, Cl. 210-179.000.

Wendt, Jerry P.; and Steckl, Andrew J., to United States of America, Air Force. Electromagnetic interference filter window. 4,181,774, Cl. 428-335.000.

Wengeler, Wilhelm; Wolstein, Friedrich; and Hoffmann, Egbert, to UHDE GmbH. Method for the treatment of phosphate rock. 4,181,703, Cl. 423-167.000.

Wenninger, Fred, Jr.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.

Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., to Hewlett-Packard Company. Adaptable programmed calculator including a percent keyboard operator. 4,181,966, Cl. 364-715.000.

Wentorf, Robert H., Jr.: *See—*
De Vries, Robert C.; Bundy, Francis P.; and Wentorf, Robert H., Jr., 4,181,505, Cl. 51-307.000.

Wesselink, Gustaaf A.; Franken, Adrianus J. J.; and Smulders, Hendricus F. G., to U.S. Philips Corporation. Pressure energy accumulator. 4,181,155, Cl. 138-30.000.

West, Gaylon L.; and Boyle, John M., to United States of America, Navy. Mine search coil simulator. 4,181,879, Cl. 324-326.000.

West, James C., Jr.; and Shreeve, Raymond P., to United States of America, Navy. Digital programmable timing device. 4,181,962, Cl. 364-565.000.

Westerberg, Stefan, to AB Atomenergi. Method for reading the radiation dose received by a TSC dosimeter. 4,181,854, Cl. 250-336.000.

Western Electric Company, Inc.: *See—*
Beckenbaugh, William M.; Goldman, Patricia J.; and Morton, Kim L., 4,181,750, Cl. 430-414.000.
Walters, Jay A., 4,181,387, Cl. 339-17.00C.

Westinghouse Air Brake Company: *See—*
Balukin, Richard F.; and Reiss, John R., 4,181,369, Cl. 303-16.000.
Pascoe, Robert D., 4,181,278, Cl. 246-34.00R.

Westinghouse Electric Corp.: *See—*
Binstock, Morton H., 4,181,099, Cl. 122-448.00R.
Browne, Thomas E., Jr., 4,181,837, Cl. 200-148.00R.
Carter, Woodward C., II, 4,181,950, Cl. 364-492.000.
Dunn, Robert E., 4,180,902, Cl. 29-726.000.
Gemp, Robert S., 4,181,877, Cl. 318-345.00R.
Gosser, Robert B.; and Zomp, John M., 4,181,885, Cl. 324-428.000.
John, Clarence D., Jr., 4,181,008, Cl. 73-52.000.
Matsko, Joseph J.; Lange, Emroy W.; and Skalka, Paul, 4,181,906, Cl. 335-6.000.
Matsko, Joseph J.; Shimp, Alan B.; and Skalka, Paul, 4,181,922, Cl. 361-115.000.
Miller, Coleman J., 4,181,897, Cl. 331-94.50G.
Osborne, Robert L., 4,181,840, Cl. 290-40.00R.
Smith, Winthrop W., Jr., 4,181,969, Cl. 364-739.000.
Underwood, Thomas E.; and Holden, James J., III, 4,181,940, Cl. 364-200.000.
Veronesi, Luciano; and Francis, Woodie R., 4,181,471, Cl. 417-360.000.

Westley, John; and Liu, Chao-Min, to Hoffmann-La Roche Inc. Process for the production of antibiotic X-14547. 4,181,573, Cl. 435-119.000.

West's Pyro Limited: *See—*
Kimberley, Ivan E., 4,181,494, Cl. 432-2.000.

Weyer, Rudi: *See—*
Hitzel, Volker; Weyer, Rudi; Geisen, Karl; and Pfaff, Werner, 4,181,658, Cl. 424-266.000.

Wezel, Dieter: *See—*
Sicha, Horst; Wezel, Dieter; Rube, Helmut; Riedel, Wolfgang; Mattes, Gerd; and Borner, Gerhard, 4,181,410, Cl. 352-91.00R.

Wheaton, Robert F., to General Motors Corporation. Clutch assembly with wear compensation adjustment. 4,181,209, Cl. 192-111.00A.

Whirlpool Corporation: *See—*
Ahlf, Robert E., 4,181,540, Cl. 148-6.15R.

Whistler, Roy L., to Purdue Research Foundation. Daunosamine synthesis. 4,181,795, Cl. 536-4.000.

White, Breen C., to Courtaulds Limited. Composite yarn and method of forming said yarn. 4,180,968, Cl. 57-239.000.

White, Clark W.: *See—*
Narayan, Jagdish; White, Clark W.; and Young, Rosa T., 4,181,538, Cl. 148-1.300.

White, Herbert A., Jr. Cooling plates for a furnace. 4,181,294, Cl. 266-194.000.

White, Ralph L., Jr., to Morton-Norwich Products, Inc. 5(6H), 8(8aH)-dioxo-1H,3H-thiazolo[4,3-c] [1,4]thiazine. 4,181,799, Cl. 544-48.000.

Whitley, James M.: *See—*
Whitley, William N.; and Whitley, James M., 4,181,348, Cl. 296-165.000.

Whitley, William N.; and Whitley, James M. Trunk-mountable camper capsule for automobiles. 4,181,348, Cl. 296-165.000.

Whitney, Donald B.; Reilly, James A.; and Young, John M., to American Optical Corporation. Aspheric lens series. 4,181,409, Cl. 351-167.000.

Wichman, Cynthia A.: *See—*
Pedergrass, John E.; and Wichman, Cynthia A., 4,180,869, Cl. 2-240.000.

Wiederrich, James L.: *See—*
Lill, Melvin H.; and Wiederrich, James L., 4,180,915, Cl. 33-228.000.

Wiessner, Willi: *See—*
Schlapp, Werner; and Wiessner, Willi, 4,181,419, Cl. 354-286.000.

Wilber, William R.: *See—*
Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,181,769, Cl. 428-253.000.

Wilczek, Stephen P.: *See—*
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.

Wild, Hans J.: *See—*
Huber, Ulrich; and Wild, Hans J., 4,181,666, Cl. 260-347.800.

Willard, Henry G.: *See—*
Kiesel, George W.; and Willard, Henry G., 4,181,389, Cl. 339-32.00M.

Williams, Brian H.; and Zollinger, J. Lamar, to Minnesota Mining and Manufacturing Company. Laminates comprising weatherable coatings and primer compositions comprising a mixture of an acrylic polymer and a cellulosic ester. 4,181,766, Cl. 428-216.000.

Williams, Robin: *See—*
Casey, Richard G.; Langdon, Glen G., Jr.; Mantey, Patrick E.; and Williams, Robin, 4,181,952, Cl. 364-515.000.

Williams, Ronald A.: *See—*
Bayham, Edward L.; Williams, Ronald A.; and Ammann, David W., 4,181,140, Cl. 137-68.00R.

Williams, Winston D. Bumper-press printing device. 4,181,075, Cl. 101-269.000.

Williamson, Tommy L.; and Rose, Harold W., to United States of America, Air Force. Holographic field lens detector. 4,181,435, Cl. 356-141.000.

Williamson, William A., to Clark Equipment Company. Apparatus for counting particle contamination in a liquid. 4,181,009, Cl. 73-61.400.

Wilms, Hans. Filter apparatus. 4,181,615, Cl. 210-230.000.

Wilson, Porter C. Urine disposal bypass unit. 4,180,875, Cl. 4-309.000.

Wilson, Raymond G., to Coal Industry (Patents) Limited. Cutting force sensor. 4,181,360, Cl. 299-1.000.

Wilson, William N., to Atlantic Richfield Company. Well cementing in permafrost. 4,181,533, Cl. 106-104.000.

Winchell, David A.: *See—*
Bellamy, David; and Winchell, David A., 4,181,232, Cl. 215-232.000.

Windmoller & Holscher: *See—*
Achelpohl, Fritz, 4,181,345, Cl. 294-103.00R.

Wingler, Frank; Liebig, Lothar; Wassmuth, Gerd; Ullrich, Martin; and Hederich, Manfred, to Bayer Aktiengesellschaft. Process for the production of thermoplastic molding materials based on vinyl polymers. 4,181,788, Cl. 526-68.000.

Wingrove, Robert C.: *See—*
Schwoboda, George F.; and Wingrove, Robert C., 4,181,121, Cl. 128-762.000.

Wisconsin Alumni Research Foundation: *See—*
Scott, Alwyn C., 4,181,902, Cl. 331-107.00S.

Withrow, Virdean N. Newspaper tube closure. 4,181,250, Cl. 232-44.000.

Witulski, Wilfried: *See—*
Goris, Heinrich; Gunther, Roland; Ogorek, Kurt; Schwarting, Karl-Heinz; and Witulski, Wilfried, 4,181,363, Cl. 299-17.000.

Wolfer, Klaus R.: *See—*
Radulovic, Radoje; Karisik, Mustafa; and Wolfer, Klaus R., 4,180,870, Cl. 3-1.200.

Wolstein, Friedrich: *See—*
Wengeler, Wilhelm; Wolstein, Friedrich; and Hoffmann, Egbert, 4,181,703, Cl. 423-167.000.

Wolters, Ernst: *See—*
Kern, Rudolf; Schmidt, Heinz; Burg, Karlheinz; Wolters, Ernst; and Sextro, Gunter, 4,181,685, Cl. 525-402.000.

Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,181,727, Cl. 424-270.000.

Wong, Morton M.; and Haver, Frank P., to United States of America, Interior. Method of recovering lead through the direct reduction of lead chloride by aqueous electrolysis. 4,181,588, Cl. 204-115.000.

Wood, John F: *See—*
Price, Joseph C.; and Wood, John F, 4,181,170, Cl. 157-1.100.

Woodhead, James L., to United Kingdom Atomic Energy Authority. Production of colloidal dispersions. 4,181,532, Cl. 106-40.00R.

Woods, Quentin T.: *See—*
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,482, Cl. 425-28.00R.
Grawey, Charles E.; Groezinger, John J.; and Woods, Quentin T., 4,181,488, Cl. 425-577.000.

Work, Ray A., III; and Pankratz, Richard P., to Du Pont de Nemours, E. I., and Company. Subbing composition comprising treated gelatin-polyester-aziridine material for adhering photographic emulsion to polyester film base. 4,181,528, Cl. 428-474.000.

Workman, Dennis L., to Bell & Howell Company. Bandsplitter systems. 4,181,822, Cl. 179-15.55R.

Worthington, Paul A.: *See—*
Shephard, Margaret C.; and Worthington, Paul A., 4,181,518, Cl. 71-76.000.

Wright, Lawrence A.: *See—*
Morrissey, George F., Jr.; and Wright, Lawrence A., 4,181,231, Cl. 212-21.000.

Wudel, Egon; and Haase, Georg, to Vorwerk & Co. Interholding GmbH. Vacuum-cleaner attachment. 4,180,887, Cl. 15-415.00R.
Wurst, Bert: *See*—
Grather, Gunter; Wahl, Josef; Rabus, Friedrich; Wurst, Bert; and Adler, Karl-Heinz, 4,181,112, Cl. 123-148.00E.
Xerox Corporation: *See*—
Batchelor, Phillip J.; Laskowski, Kenneth W.; Gray, Gerald A., Jr.; Wilczek, Stephen P.; Mannella, Henry E.; and Steiner, Edward L., 4,181,429, Cl. 355-77.000.
Blossey, Daniel F.; Deshpande, Narayan V.; and Faucz, Eugene C., 4,181,426, Cl. 355-16.000.
Chu, Joseph Y. C.; Schank, Richard L.; and Tutihasi, Simpei, 4,181,772, Cl. 430-58.000.
Spehrley, C. W., Jr., 4,181,248, Cl. 227-3.000.
Thornburg, David D., 4,181,913, Cl. 357-2.000.
Yabuuchi, Seizo: *See*—
Horiuchi, Goh; Yabuuchi, Seizo; Suzuki, Satoru; and Amaha, Mikio, 4,181,742, Cl. 426-12.000.
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, to Honda Giken Kogyo Kabushiki Kaisha. Divided auxiliary combustion chamber for internal combustion engine. 4,181,102, Cl. 123-75.00B.
Yamada, Takashi: *See*—
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,181,884, Cl. 324-208.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yamamoto, Yasuo, 4,181,101, Cl. 123-73.00A.
Yamamoto, Kenji, to Sony Corporation. Apparatus for receiving signals in plural frequency bands. 4,181,890, Cl. 325-316.000.
Yamamoto, Shigeo: *See*—
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; Asao, Shuichiro; and Nakayama, Yoshinori, 4,181,732, Cl. 424-273.00R.
Yamamoto, Takemi: *See*—
Hashimoto, Kiyozi; Shimatani, Tsuyoshi; Yamamoto, Takemi; Morimoto, Ryoichi; and Ueda, Ikuo, 4,181,228, Cl. 209-552.000.
Yamamoto, Yasuo, to Yamaha Hatsudoki Kabushiki Kaisha. Two-cycle internal combustion engines with scavenger means. 4,181,101, Cl. 123-73.00A.
Yamamuro, Okimasa: *See*—
Ohashi, Nozomu; Yamamuro, Okimasa; Asakura, Takasuke; and Nakagawa, Akira, 4,181,711, Cl. 428-40.000.
Yamane, Kimitaka; Morita, Akira; and Ueno, Zene, to Nissan Motor Company, Limited. Internal combustion engine operated on injected fuel supplemented with hydrogen. 4,181,100, Cl. 123-32.0ST.
Yamauchi, Junnosuke: *See*—
Takamatsu, Hideo; Minatono, Shobu; Terao, Katsuyoshi; and Yamauchi, Junnosuke, 4,181,635, Cl. 260-5.000.
Yamauchi, Teruo; Oyama, Yoshishige; and Miyakawa, Nobuaki, to Hitachi, Ltd. Apparatus for engine control. 4,181,944, Cl. 364-431.000.
Yamawaki, Kensaku: *See*—
Ishimoto, Ryoji; Hasuo, Katsuhiko; Hisatomi, Masanori; Yamawaki, Kensaku; Masuda, Sadao; and Tada, Seiichi, 4,181,761, Cl. 428-31.000.
Yamazi, Masami: *See*—
Tatsumi, Toshio; Otani, Tadashi; and Yamazi, Masami, 4,181,923, Cl. 361-293.000.
Yan, Tsoung-Yuan; and Bridger, Robert F., to Mobil Oil Corporation. Method of stabilizing lube oils. 4,181,597, Cl. 208-46.000.
Yanagawa, Mikio, to Casio Computer Co., Ltd. Electronic calculator with time counting function. 4,181,963, Cl. 364-705.000.
Yang, Yin-Lung. Motorcycle and bicycle safety controls. 4,181,190, Cl. 180-219.000.
Yockey, Francis J.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,181,965, Cl. 364-710.000.
Yonemitsu, Mikio, to Hitachi Metals, Ltd. Molding sand feeding device. 4,181,171, Cl. 164-193.000.
Yoshida, Noboru; Kiyohara, Takao; and Ogino, Shigeo, to Sumitomo Chemical Company, Limited. Novel therapeutic application of 4-carbamoyl-5-hydroxyimidazole. 4,181,731, Cl. 424-273.00R.
Yoshida, Tadao, to Sony Corporation. Amplifier with muting circuit. 4,181,895, Cl. 330-279.000.
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Method of manufacturing junction field effect transistors. 4,181,542, Cl. 148-187.000.
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha, part interest to each. Pneumatically and temperature controlled valve construction. 4,181,254, Cl. 236-87.000.
Yoshikawa, Norio, to Denki Onkyo Co., Ltd. Deflection coil. 4,181,908, Cl. 335-210.000.
Yoshikawa, Ryoichi: *See*—
Sugiura, Yoji; Tezuka, Nobuo; Yoshikawa, Ryoichi; and Masanori, Uchidoi, 4,181,417, Cl. 354-152.000.
Yoshino, Masatsugu: *See*—
Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, 4,181,694, Cl. 264-41.000.
Youdelis, William V. Process for surface coating gold alloys onto a metallic substrate to enhance corrosion protection. 4,181,757, Cl. 427-229.000.
Young, John M.: *See*—
Whitney, Donald B.; Reilly, James A.; and Young, John M., 4,181,409, Cl. 351-167.000.
Young, Lewis B., to Mobil Oil Corporation. Selective reaction of 1,4-disubstituted aromatic compounds. 4,181,811, Cl. 585-486.000.
Young, Rosa T.: *See*—
Narayan, Jagdish; White, Clark W.; and Young, Rosa T., 4,181,538, Cl. 148-1.500.
Young, Simon; and Rue, L. B. Material processing apparatus and breaker assembly utilized therein. 4,181,265, Cl. 241-257.00R.
Yukio, Suzuki: *See*—
Yoshihiro, Naruse; Takeharu, Ohumi; Yukio, Suzuki; Toshiro, Harada; and Takao, Okuno, 4,181,254, Cl. 236-87.000.
Zaar, Wolfgang: *See*—
Maahs, Gunther; Rombusch, Konrad; and Zaar, Wolfgang, 4,181,790, Cl. 526-143.000.
Zahid, Abduz, to Greer Hydraulics, Inc. Pressure accumulator with anti-extrusion gas charging valve assembly. 4,181,156, Cl. 138-30.000.
Zalesak, Jan; and Bednar, Miloslav, to Vyzkumny ustav tvarecich stroju a technologie tvareni. Cross wedge rolling apparatus. 4,181,001, Cl. 72-108.000.
Zbell, Richard P.: *See*—
Russell, Neil E.; Cameron, Russell J.; Zbell, Richard P.; and Schmaltz, Lloyd L., 4,181,148, Cl. 137-596.160.
Zelina, Thomas, to Lighting Systems, Inc. Portable spot/flood light. 4,181,928, Cl. 362-184.000.
Zen, Marcello, to Pietro Laverda S.p.A. Device for regulating the height of the cutter platform of combine harvesters. 4,180,966, Cl. 56-208.000.
Zenith Radio Corporation: *See*—
Skerlos, Peter C., 4,181,891, Cl. 325-464.000.
Stevens, Michael T., 4,181,870, Cl. 313-414.000.
Zicko, James A., to Container Corporation of America. Display packaging insert. 4,181,220, Cl. 206-315.00R.
Ziebarth, John A.: *See*—
Rosenthal, Leo; Isaacson, Leonard M.; and Ziebarth, John A., 4,181,954, Cl. 364-520.000.
Zigman, Alvin R.: *See*—
Martens, John A.; Clemens, Lawrence M.; and Zigman, Alvin R., 4,181,752, Cl. 427-54.100.
Zimmer Aktiengessellschaft: *See*—
Koschinek, Gunter; and Wandel, Dietmar, 4,181,697, Cl. 264-176.00F.
Zimmerman, Edwin H. Double bay woodworking machine. 4,181,056, Cl. 83-360.000.
Zimmerman, Philip R. Honing machine. 4,180,945, Cl. 51-34.00C.
Zinke, Andrew E., to Striker, Inc. Torch igniter. 4,181,492, Cl. 431-264.000.
Ziv, Avraham: *See*—
Hollowell, William M.; and Ziv, Avraham, 4,181,326, Cl. 280-806.000.
Zodrow, Rudolf, to Jagenberg-Werke Aktiengesellschaft. Labeling machine for bottles and the like. 4,181,562, Cl. 156-568.000.
Zollinger, J. Lamar: *See*—
Williams, Brian H.; and Zollinger, J. Lamar, 4,181,766, Cl. 428-216.000.
Zomp, John M.: *See*—
Gosser, Robert B.; and Zomp, John M., 4,181,885, Cl. 324-428.000.
Zumbach Electronic AG: *See*—
Nopper, Peter, 4,181,961, Cl. 364-563.000.
Zuvela, Bernard R.; Teys, Raymond W.; and Johnson, Richard A., to Scientific Drilling Controls, Inc. Remote well signalling apparatus and methods. 4,181,014, Cl. 73-151.000.
Zygiel, Alfred E., deceased; and by Zygiel, Mary E., executrix, to Cornelius Company, The. Method and apparatus for dispensing a beverage. 4,181,242, Cl. 222-1.000.
Zygiel, Mary E., executrix: *See*—
Zygiel, Alfred E., deceased; and Zygiel, Mary E., executrix, 4,181,242, Cl. 222-1.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF JANUARY, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Bedford Limited: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T990,001, Cl. 430-162.000.

Cameron, Robert G.: *See—*
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., T990,004, Cl. 260-559.00R.

Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J. Fluorinated 1-hydroxy-2-naphthamide coupler, coupler compositions and photographic elements suited to forming integral sound tracks. T990,004, 1-1-80, Cl. 260-559.00R.

Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., to Bedford Limited. Light-sensitive vesicular imaging materials. T990,001, 1-1-80, Cl. 430-162.000.

Iaconelli, William B. Process for the electrodialysis treatment of whey. T990,005, 1-1-80, Cl. 426-239.000.

Lothian, David E.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T990,001, Cl. 430-162.000.

Rennison, Stuart C.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T990,001, Cl. 430-162.000.

Sethi, Gurdip S. Electrochemical cell and battery. T990,007, 1-1-80, Cl. 429-158.000.

Stoesser, P. Richard. Actuator for dispensing apparatus. T990,002, 1-1-80, Cl. 222-323.000.

Sweeney, George A. Dispenser. T990,003, 1-1-80, Cl. 222-383.000.

Titman, Michael K.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T990,001, Cl. 430-162.000.

Walsh, Edward J.: *See—*
Fernandez, Jose M.; Cameron, Robert G.; and Walsh, Edward J., T990,004, Cl. 260-559.00R.

Williams, James A. Non-woven nets. T990,006, 1-1-80, Cl. 428-131.000.

LIST OF DESIGN PATENTEES

Addison, Carl E.; and Comes, Rocky J. Irrigation spray nozzle. 253,842, 1-1-80, Cl. D23-35.000.

Altmiller, Albert. Axe scabbard. 253,798, 1-1-80, Cl. D2-400.000.

American Standard Inc.: *See—*
Saporito, Dominic A.; and Genaro, Donald M., 253,799, Cl. D23-25.000.

Aqua-Mist, Inc.: *See—*
Morrow, William B., 253,845, Cl. D23-147.000.
Morrow, William B., 253,846, Cl. D23-147.000.

Atlanta National League Baseball Club, Inc.: *See—*
Hope, Robert E., 253,835, Cl. D21-158.000.

Baltimore Aircoil Company, Inc.: *See—*
Engalitcheff, John, Jr., 253,844, Cl. D23-139.000.

Baylis, Frank E. Blade for a garden hoe. 253,807, 1-1-80, Cl. D8-11.000.

Beall, Lester, to Modern Angel Furniture Manufacturing, Inc. Sofa or similar article. 253,801, 1-1-80, Cl. D6-63.000.

Bell Telephone Laboratories, Incorporated: *See—*
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 253,821, Cl. D14-60.000.

Bemiss, James M. Commando armored patrol car. 253,815, 1-1-80, Cl. D12-12.000.

Bljumshtein, Zigmund G.; and Bychkin, Lev A. Pressure gauge. 253,811, 1-1-80, Cl. D10-85.000.

Blue Cross Products Pty. Ltd.: *See—*
Zajitz, Horst F., 253,852, Cl. D30-38.000.

Boggs, LeRoy R.: *See—*
Lange, H. Frederick; and Boggs, LeRoy R., 253,808, Cl. D8-371.000.

Braun Aktiengesellschaft: *See—*
Rams, Dieter, 253,823, Cl. D14-96.000.

Bunker Ramo Corporation: *See—*
Coppola, John B.; and Ferrara, James R., 253,820, Cl. D14-43.000.

Bychkin, Lev A.: *See—*
Bljumshtein, Zigmund G.; and Bychkin, Lev A., 253,811, Cl. D10-85.000.

Carmichael, Vivian L. Medical calendar. 253,831, 1-1-80, Cl. D19-25.000.

Comes, Rocky J.: *See—*
Addison, Carl E.; and Comes, Rocky J., 253,842, Cl. D23-35.000.

Cook, Calvin S.; Smith, James; Vernon, John A., Jr.; and Ratkiewich, Richard, to Louis Marx & Co., Inc. Toy vehicle. 253,832, 1-1-80, Cl. D21-80.000.

Coppola, John B.; and Ferrara, James R., to Bunker Ramo Corporation. Keyboard terminal. 253,820, 1-1-80, Cl. D14-43.000.

Cox, Mayo A. Garden weeder implement. 253,806, 1-1-80, Cl. D8-1.000.

Cox, Zula B. Medical rag doll. 253,836, 1-1-80, Cl. D21-166.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Serving tongs or the like. 253,803, 1-1-80, Cl. D7-105.000.

Dart Industries Inc.: *See—*
Daenen, Robert H. C. M., 253,803, Cl. D7-105.000.

DLM, Inc.: *See—*
Eckert, Ronald P., 253,800, Cl. D6-24.000.

Eckert, Ronald P., to DLM, Inc. Display stand. 253,800, 1-1-80, Cl. D6-24.000.

Eltra Corporation: *See—*
Wechsler, Joel K., 253,796, Cl. D2-321.000.
Wechsler, Joel K., 253,797, Cl. D2-321.000.

Engalitcheff, John, Jr., to Baltimore Aircoil Company, Inc. Water injected cooling tower. 253,844, 1-1-80, Cl. D23-139.000.

EWG Import-und Export-Gesellschaft mit beschrankter Haftung: *See—*
Wandel, Stephan H. A., 253,804, Cl. D7-107.000.

Facciolla, Betty: *See—*
Major, William; and Facciolla, Betty, 253,847, Cl. D25-23.000.

Fernandez, Mario F., to Toro Co., The. Irrigation control console. 253,843, 1-1-80, Cl. D23-38.000.

Ferrara, James R.: *See—*
Coppola, John B.; and Ferrara, James R., 253,820, Cl. D14-43.000.

Garden Maid, Inc.: *See—*
Sheldon, Gary L., 253,825, Cl. D15-12.000.

Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Telephone stand. 253,821, 1-1-80, Cl. D14-60.000.

Genaro, Donald M.: *See—*
Saporito, Dominic A.; and Genaro, Donald M., 253,799, Cl. D23-25.000.

Gerber, Michael, to Trakliting, Inc. Lighting fixture. 253,853, 1-1-80, Cl. D48-23.00R.

Gillum, Gary C., to Klipsch and Associates, Inc. Low frequency loudspeaker. 253,819, 1-1-80, Cl. D14-35.000.

Glass Head, Inc.: *See—*
Karp, Morry, 253,848, Cl. D27-3.000.

Hall, William C. Toy projectile. 253,834, 1-1-80, Cl. D21-89.000.

Hamada, Masanori; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Portable radio. 253,822, 1-1-80, Cl. D14-70.000.

Hargrave, Glenn K., to Technopower Enterprises Limited. Gas engine. 253,824, 1-1-80, Cl. D15-3.000.

Hartung, Philip F. Bottle. 253,809, 1-1-80, Cl. D9-61.000.

Haselrig, William E., to Transwestern Sales, Inc. Combined spray atomizer and comb. 253,850, 1-1-80, Cl. D28-25.000.

Hill, Joe B. Wall plaque. 253,814, 1-1-80, Cl. D11-132.000.

Hiraishi, Etsuo; and Okamoto, Teruo, to Ryobi Ltd. Fishing reel. 253,837, 1-1-80, Cl. D22-25.000.

Hiraishi, Etsuo, to Ryobi Ltd. Fishing reel. 253,840, 1-1-80, Cl. D22-25.000.

Hope, Robert E., to Atlanta National League Baseball Club, Inc. Doll. 253,835, 1-1-80, Cl. D21-158.000.

Hopf, Lawrence L. Tackle box. 253,855, 1-1-80, Cl. D3-38.000.

Johnson Products Co., Inc.: *See—*
Schroeder, George A., 253,849, Cl. D28-24.000.

Karp, Morry, to Glass Head, Inc. Ceramic water pipe. 253,848, 1-1-80, Cl. D27-3.000.

Kilberg, Alan C., Jr., to Minnesota Mining and Manufacturing Company. Film spool. 253,818, 1-1-80, Cl. D14-10.000.

Klick, George C. Garbage can enclosure. 253,805, 1-1-80, Cl. D7-189.000.

Klipsch and Associates, Inc.: *See—*
Gillum, Gary C., 253,819, Cl. D14-35.000.

Lange, H. Frederick; and Boggs, LeRoy R. Corner bracket assembly for lift gate of a wood slatted hay rack or the like. 253,808, 1-1-80, Cl. D8-371.000.
Lohmeyer, Kurt W., to Tru-Spoke, Inc. Vehicle wheel. 253,817, 1-1-80, Cl. D12-205.000.
Loud, Barry H.; and Redmon, Eileen M. Wine rack. 253,802, 1-1-80, Cl. D7-71.000.
Louis Marx & Co., Inc.: *See*—
Cook, Calvin S.; Smith, James; Vernon, John A., Jr.; and Ratkiewich, Richard, 253,832, Cl. D21-80.000.
Major, William; and Facciolla, Betty. House. 253,847, 1-1-80, Cl. D25-23.000.
Mankau, Dieter: *See*—
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 253,829, Cl. D16-1.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hamada, Masanori; and Mishiro, Benito, 253,822, Cl. D14-70.000.
McGarvey, John N.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 253,821, Cl. D14-60.000.
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, to Rollei-Werke Franke & Heidecke. Mirror reflex camera. 253,829, 1-1-80, Cl. D16-1.000.
Miller, Lavon C. Kite. 253,833, 1-1-80, Cl. D21-88.000.
Minnesota Mining and Manufacturing Company: *See*—
Kilberg, Alan C., Jr., 253,818, Cl. D14-10.000.
Stone, Stanford C., 253,810, Cl. D9-224.000.
Mishiro, Benito: *See*—
Hamada, Masanori; and Mishiro, Benito, 253,822, Cl. D14-70.000.
Modern Angel Furniture Manufacturing, Inc.: *See*—
Beall, Lester, 253,801, Cl. D6-63.000.
Morishita, Yasomatsu, to Ryobi Ltd. Fishing reel. 253,839, 1-1-80, Cl. D22-25.000.
Morrow, William B., to Aqua-Mist, Inc. By-pass humidifier. 253,845, 1-1-80, Cl. D23-147.000.
Morrow, William B., to Aqua-Mist, Inc. By-pass humidifier. 253,846, 1-1-80, Cl. D23-147.000.
Novak, Harry N. Inventory control counter. 253,812, 1-1-80, Cl. D10-97.000.
Okamoto, Teruo: *See*—
Hiraishi, Etsuo; and Okamoto, Teruo, 253,837, Cl. D22-25.000.
Papke, Friedrich: *See*—
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 253,829, Cl. D16-1.000.
Rams, Dieter, to Braun Aktiengesellschaft. Combined tuner and amplifier. 253,823, 1-1-80, Cl. D14-96.000.
Ratkiewich, Richard: *See*—
Cook, Calvin S.; Smith, James; Vernon, John A., Jr.; and Ratkiewich, Richard, 253,832, Cl. D21-80.000.
Redmon, Eileen M.: *See*—
Loud, Barry H.; and Redmon, Eileen M., 253,802, Cl. D7-71.000.
Rollei-Werke Franke & Heidecke: *See*—
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 253,829, Cl. D16-1.000.
Ryobi Ltd.: *See*—
Hiraishi, Etsuo; and Okamoto, Teruo, 253,837, Cl. D22-25.000.
Hiraishi, Etsuo, 253,840, Cl. D22-25.000.
Morishita, Yasomatsu, 253,839, Cl. D22-25.000.
Sakamoto, Masakazu; and Shohoji, Takeshi, 253,838, Cl. D22-25.000.
Sakamoto, Masakazu; and Shohoji, Takeshi, to Ryobi Ltd. Fishing reel. 253,838, 1-1-80, Cl. D22-25.000.
Salvaggio, Frank A. Medallion. 253,813, 1-1-80, Cl. D11-99.000.
Sanderson, Charles H. Magnetic water conditioner. 253,841, 1-1-80, Cl. D23-3.000.
Sano, Norimasa, to Yasui Sangyo Co., Ltd. Fluid jet machine for washing or coating a vehicle. 253,826, 1-1-80, Cl. D15-37.000.
Saporito, Dominic A.; and Genaro, Donald M., to American Standard Inc. Faucet or similar article. 253,799, 1-1-80, Cl. D23-25.000.
Schroeder, George A., to Johnson Products Co., Inc. Heated comb. 253,849, 1-1-80, Cl. D28-24.000.
Sheldon, Gary L., to Garden Maid, Inc. Combined auger and tine unit for a garden tiller. 253,825, 1-1-80, Cl. D15-12.000.
Shohoji, Takeshi: *See*—
Sakamoto, Masakazu; and Shohoji, Takeshi, 253,838, Cl. D22-25.000.
Smith, James: *See*—
Cook, Calvin S.; Smith, James; Vernon, John A., Jr.; and Ratkiewich, Richard, 253,832, Cl. D21-80.000.
Soldner, Paul E. Potters wheel. 253,828, 1-1-80, Cl. D15-130.000.
Sperry, Paul A. Nail file holder or similar article. 253,851, 1-1-80, Cl. D28-59.000.
Stone, Stanford C., to Minnesota Mining and Manufacturing Company. Developer powder container. 253,810, 1-1-80, Cl. D9-224.000.
Strignano, Joseph R. Track light. 253,854, 1-1-80, Cl. D48-23.00R.
Sylvester, Gordon E.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 253,821, Cl. D14-60.000.
Technopower Enterprises Limited: *See*—
Hargrave, Glenn K., 253,824, Cl. D15-3.000.
Toro Co., The: *See*—
Fernandez, Mario F., 253,843, Cl. D23-38.000.
Torres, Richard J. Wax stripper and applicator. 253,827, 1-1-80, Cl. D15-48.000.
Trakliting, Inc.: *See*—
Gerber, Michael, 253,853, Cl. D48-23.00R.
Transwestern Sales, Inc.: *See*—
Haselrig, William E., 253,850, Cl. D28-25.000.
Tru-Spoke, Inc.: *See*—
Lohmeyer, Kurt W., 253,817, Cl. D12-205.000.
Turek, Timothy R. Vehicle overhead display panel. 253,816, 1-1-80, Cl. D12-155.000.
Vernon, John A., Jr.: *See*—
Cook, Calvin S.; Smith, James; Vernon, John A., Jr.; and Ratkiewich, Richard, 253,832, Cl. D21-80.000.
Wandel, Stephan H. A., to EWG Import-und Export-Gesellschaft mit beschrankter Haftung. Barbeque grill. 253,804, 1-1-80, Cl. D7-107.000.
Wechsler, Joel K., to Eltra Corporation. Outsole for sports shoe. 253,796, 1-1-80, Cl. D2-321.000.
Wechsler, Joel K., to Eltra Corporation. Outsole for sports shoe. 253,797, 1-1-80, Cl. D2-321.000.
Wright, R. Wallace. Slide chart. 253,830, 1-1-80, Cl. D18-9.000.
Yasui Sangyo Co., Ltd.: *See*—
Sano, Norimasa, 253,826, Cl. D15-37.000.
Zajitz, Horst F., to Blue Cross Products Pty. Ltd. Cat collar. 253,852, 1-1-80, Cl. D30-38.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 1, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

89 4,180,867
203 4,180,868
240 4,180,869

CLASS 3

1.2 4,180,870
1.91 4,180,871
1.912 4,180,873
7 4,180,872

CLASS 4

173 M 4,180,874
309 4,180,875
321 4,180,876

CLASS 5

263 4,180,877
431 4,180,878
508 4,180,879

CLASS 8

2.5 A 4,181,497
18 A 4,181,498
26 4,181,499
154 4,180,880

CLASS 9

2 F 4,180,881
11 A 4,180,882
312 4,180,883

CLASS 13

35 4,181,812

CLASS 15

21 R 4,180,884
250.04 4,180,886
250.32 4,180,885
415 R 4,180,887

CLASS 16

58 4,180,888

CLASS 17

32 4,180,889

CLASS 23

230 B 4,181,500
4,181,501

CLASS 24

204 4,180,890
206 B 4,180,891

CLASS 29

25.35 4,180,892
33 K 4,180,893
36 4,180,894
149.5 C 4,180,895
157 R 4,180,896
157.3 A 4,180,897
402.07 4,180,898
512 4,180,899
566 4,180,900
621 4,180,901
726 4,180,902
727 4,180,903
749 4,180,904
786 4,180,905

CLASS 30

42 4,180,906
64 4,180,907
279 R 4,180,908
332 4,180,909

CLASS 33

161 4,180,914
228 4,180,915
318 4,180,916

CLASS 34

5 4,180,917
13 4,180,918
23 4,180,919

CLASS 35

9 D 4,180,920
59 4,180,921

CLASS 36

2.6 4,180,922
32 R 4,180,923
129 4,180,924

CLASS 37

126 AE 4,180,925
142 R 4,180,926
190 4,180,927

CLASS 38

77.83 4,180,928

CLASS 40

2.2 4,180,929
160 4,180,930
219 4,180,931
455 4,180,932
471 4,180,933
580 4,180,934

CLASS 43

9 4,180,935
42.5 4,180,936
87 4,180,937

CLASS 44

10 C 4,181,502

CLASS 46

6 4,180,938
75 4,180,939
216 4,180,940

CLASS 47

14 4,180,941

CLASS 48

196 A 4,181,503
197 R 4,181,504

CLASS 49

125 4,180,942
279 4,180,943
504 4,180,944

CLASS 51

34 C 4,180,945
134.5 R 4,180,946
307 4,181,505
326 4,180,947
411 4,180,948

CLASS 52

67 4,180,949
81 4,180,950
100 4,180,951
148 4,180,952
169.14 4,180,953
171 4,180,954
221 4,180,955
407 4,180,956
718 4,180,957
747 4,180,958

CLASS 53

334 4,180,959
403 4,180,960
421 4,180,961
556 4,180,962

CLASS 54

24 4,180,963

CLASS 55

48 4,181,506
73 4,181,507
82 4,181,508
106 4,181,509
183 4,181,510
274 4,181,511
4,181,512
316 4,181,513
488 4,181,514

CLASS 56

10.2 4,180,964
27.5 4,180,965
208 4,180,966

CLASS 57

66 4,180,967
239 4,180,968

CLASS 58

42.5 4,180,969
57.5 4,180,970

CLASS 59

87 4,180,971

CLASS 60

39.32 4,180,972
39.51 R 4,180,973
39.71 4,180,974
290 4,180,975
325 4,180,976
342 4,180,977
345 4,180,978
395 4,180,979
398 4,180,980
435 4,180,981
531 4,180,982
657 4,180,983

CLASS 62

6 4,180,984
94 4,180,985
192 4,180,986
341 4,180,987
474 4,180,988

CLASS 64

17 R 4,180,989
30 R 4,180,990

CLASS 65

3 A 4,181,515

CLASS 66

14 4,180,991
75.1 4,180,992
107 4,180,993

CLASS 68

18 F 4,180,994
242 4,180,995

CLASS 70

52 4,180,996
227 4,180,998
366 4,180,999

CLASS 71

25 4,181,516
73 4,181,517
76 4,181,518
98 4,181,519

CLASS 72

60 4,181,000
108 4,181,001
217 4,180,997
387 4,181,002
441 4,181,003

CLASS 73

1 DV 4,181,004
19 4,181,005
23.1 4,181,006
37.8 4,181,007
52 4,181,008
61.4 4,181,009
119 A 4,181,010
141 A 4,181,011
4,181,012
151 4,181,014
159 4,181,015
168 4,181,016
4,181,017
194 EM 4,181,013
4,181,018
4,181,019
194 VS 4,181,020
317 4,181,021
422 TC 4,181,022
432 R 4,181,023
660 4,181,024
665 4,181,025
4,181,026
4,181,027
4,181,028
4,181,029

CLASS 74

12 4,181,030
99 R 4,181,032
234 4,181,031
243 NC 4,181,034
243 R 4,181,033
250 R 4,181,035
477 4,181,036
569 4,181,037
574 4,181,038
665 GA 4,181,039
677 4,181,040
687 4,181,041
750 B 4,181,043
750 R 4,181,042
752 E 4,181,044

CLASS 75

36 4,181,520
53 4,181,521
96 4,181,522
123 G 4,181,524
171 4,181,523
255 4,181,525

CLASS 76

112 4,181,045

CLASS 81

5.1 R 4,181,046
9.51 4,181,047
90 C 4,181,048

CLASS 82

1 C 4,181,049
56 4,181,050

CLASS 83

19 4,181,051
79 4,181,052
80 4,181,053
153 4,181,054
350 4,181,055
360 4,181,056
486.1 4,181,057

CLASS 84

1.16 4,181,058
1.24 4,181,059

CLASS 85

64 4,181,060
80 4,181,061

CLASS 89

1.5 F 4,181,062

CLASS 91

6 4,181,064
167 R 4,181,065
306 4,181,066
485 4,181,067

CLASS 93

1 A 4,181,068
35 R 4,181,069
60 4,181,070

CLASS 99

317 4,181,071
353 4,181,072
416 4,181,073
421 HH 4,181,074

CLASS 101

269 4,181,075
350 4,181,076
401.1 4,181,077
426 4,181,078

CLASS 102

56 SC 4,181,079

CLASS 104

148 MS 4,181,080

CLASS 106

40 R 4,181,532
104 4,181,533

CLASS 110

212 4,181,081
297 4,181,082

CLASS 112

67 4,181,083
71 4,181,084
121.12 4,181,085
158 F 4,181,086
264.1 4,181,087
292 4,181,088

CLASS 116

278 4,181,089
309 4,181,090

CLASS 118

63 4,181,091
72 4,181,092
323 4,181,093
652 4,181,094

CLASS 119

1 4,181,095
4,181,096
51.11 4,181,097

CLASS 122

26 4,181,098
448 R 4,181,099

CLASS 123

32 ST 4,181,100
73 A 4,181,101
75 B 4,181,102
102 4,181,103
4,181,104
117 A 4,181,105
4,181,106
119 A 4,181,109
4,181,110
119 EC 4,181,108
119 F 4,181,107
133 4,181,111
148 CC 4,181,114
148 E 4,181,112
4,181,113

CLASS 125

21 4,181,115

CLASS 126

60 4,181,116
120 4,181,117
286 4,181,119
429 4,181,118

CLASS 127

67 4,181,534
68 4,181,535

CLASS 128

6 4,181,123
66 4,181,124
75 4,181,125
155 4,181,127
201.21 4,181,126
205.26 4,181,129
207.21 4,181,128
214 E 4,181,130
303.15 4,181,131
399 4,181,132
419 PG 4,181,133
660 4,181,120
680 4,181,122
689 4,181,134
703 4,181,135
762 4,181,121

CLASS 131

171 R 4,181,136

CLASS 134

2 4,181,536

CLASS 137

13 4,181,137
54 4,181,138
68 A 4,181,139
68 R 4,181,140
119 4,181,141
124 4,181,142
322 4,181,143
484.4 4,181,144
493.8 4,181,145
493.9 4,181,146
572 4,181,147
596.16 4,181,148
614.02 4,181,149
614.06 4,181,150
625.28 4,181,151
637.1 4,181,152
838 4,181,153
863 4,181,154

CLASS 138

30 4,181,155
4,181,156
126 4,181,157

CLASS 139

33 4,181,158
116 4,181,159

CLASS 141

1 4,181,160
8 4,181,161
105 4,181,162
381 4,181,163

CLASS 144

3 R 4,181,164
325 4,181,165

CLASS 145

2 R 4,181,166

CLASS 148

1.5 4,181,537
4,181,538
6.15 R 4,181,539
4,181,540
16.6 4,181,541
127 4,181,543
175 4,181,544
187 4,181,542

CLASS 149

19.9 4,181,545
21 4,181,546

CLASS 150

1.5 R 4,181,167

CLASS 152

362 CS 4,181,168
404 4,181,169

CLASS 156

98 4,181,547
145 4,181,548
146 4,181,549
164 4,181,550
199 4,181,551
204 4,181,552
211 4,181,553
261 4,181,554
265 4,181,555
292 4,181,556
331 4,181,557
355 4,181,558
389 4,181,559
542 4,181,560
566 4,181,561
568 4,181,562
643 4,181,563
4,181,564

CLASS 157

1.1 4,181,170

CLASS 162

76 4,181,565
164 EP 4,181,566
168 NA 4,181,567
343 4,181,568

CLASS 164

193 4,181,171

CLASS 165

51 4,181,172
169 4,181,173
180 4,181,174

CLASS 166

85 4,181,175
252 4,181,176
256 4,181,177
274 4,181,178
361 4,181,196

CLASS 169

47 4,181,179

CLASS 172

50 4,181,180
443 4,181,181

CLASS 173

23 4,181,182
119 4,181,183

CLASS 174

92 4,181,814
101.5 4,181,815

CLASS 175

65 4,181,184
229 4,181,185
297 4,181,186
410 4,181,187

CLASS 176

36 R 4,181,569
38 4,181,570
40 4,181,571
87 4,181,572

CLASS 178

22 4,181,816
68 4,181,817

CLASS 179

1 GA 4,181,819
1 J 4,181,820
1 P 4,181,818
1 SD 4,181,821
1 SE 4,181,813
15.55 R 4,181,822
100.11 4,181,823
170 D 4,181,824

CLASS 180

2 A 4,181,188
11 4,181,189
219 4,181,190
232 4,181,192
289 4,181,191

CLASS 181

185 4,181,193

CLASS 182

112 4,181,194
230 4,181,195

CLASS 187

29 R 4,181,197

CLASS 188

1 C 4,181,198
72.9 4,181,199
73.5 4,181,200
171 4,181,201
252 4,181,202

CLASS 192

0.084 4,181,206
3.3 4,181,203
4 A 4,181,204
58 B 4,181,205
98 4,181,207
106.1 4,181,208
111 A 4,181,209
114 T 4,181,210

CLASS 198

339 4,181,211
419 4,181,212
4,181,213
467 4,181,214
483 4,181,215
757 4,181,216
842 4,181,217

CLASS 200

1 V 4,181,825
6 A 4,181,827
18 4,181,828
33 R 4,181,829
35 H 4,181,830
61.25 4,181,831
61.58 B 4,181,832
61.62 4,181,833
61.89 4,181,834
82 E 4,181,835
144 R 4,181,836
148 R 4,181,837
153 LA 4,181,838
340 4,181,826

CLASS 202

181 4,181,577
239 4,181,578

CLASS 204

1 R 4,181,579
28 4,181,580
52 R 4,181,582
67 4,181,583
4,181,584
98 4,181,585
4,181,586
4,181,587
115 4,181,588
180 R 4,181,589
192 N 4,181,590
275 4,181,591
283 4,181,592
290 F 4,181,593
299 R 4,181,594

CLASS 206

205 4,181,218
217 4,181,219
223 4,181,222
315 R 4,181,220
317 4,181,221
365 4,181,223
486 4,181,224
494 4,181,225
519 4,181,226

CLASS 208

11 R 4,181,596
18 4,181,595
46 4,181,597
58 4,181,598
79 4,181,599
113 4,181,600
143 4,181,601
216 PP 4,181,602

CLASS 209

552 4,181,228
682 4,181,603

CLASS 210

8 4,181,604
19 4,181,605
22 A 4,181,606
36 4,181,607
71 4,181,608
72 4,181,609
85 4,181,610
149 4,181,611
169 4,181,612
179 4,181,613
221 P 4,181,614
230 4,181,615
297 4,181,616

CLASS 211

184 4,181,229
208 4,181,230

CLASS 212

21 4,181,231

CLASS 215

232 4,181,232
247 4,181,233

CLASS 217

122 4,181,234

CLASS 219

8.5 4,181,845
10.49 A 4,181,846

CLASS 220

5 A 4,181,235
6 4,181,236
71 4,181,237
314 4,181,238
461 4,181,239

CLASS 221

39 4,181,240
211 4,181,241

CLASS 222

1 4,181,242
189 4,181,243
227 4,181,244
450 4,181,245
548 4,181,246

CLASS 226

97 4,181,247

CLASS 227

3 4,181,248

CLASS 228

121 4,181,249

CLASS 232

44 4,181,250

CLASS 235

92 CC 4,181,847
92 DN 4,181,848
92 T 4,181,849
451 4,181,251

CLASS 236

12 R 4,181,252
49 4,181,253
87 4,181,254

CLASS 239

54 4,181,255
81 4,181,256
183 4,181,257
186 4,181,258
206 4,181,259
265.39 4,181,260
288.5 4,181,261
404 4,181,262

CLASS 241

19 4,181,263
117 4,181,264
257 R 4,181,265
264 4,181,266

CLASS 242

25 R 4,181,267
54 A 4,181,268
65 4,181,269
66 4,181,270
74 4,181,271
74.1 4,181,272
107.2 4,181,273
118.11 4,181,274

CLASS 244

213 4,181,275
215 4,181,276
218 4,181,277

CLASS 246

34 R 4,181,278

CLASS 248

70 4,181,279
405 4,181,280
416 4,181,281
448 4,181,282
514 4,181,284
550 4,181,283

CLASS 249

61 4,181,285
82 4,181,286
154 4,181,287

CLASS 250

203 R 4,181,851
286 4,181,852
304 4,181,853
336 4,181,854
363 R 4,181,855
366 4,181,856
402 4,181,857
445 T 4,181,850
4,181,858
476 4,181,859
492 A 4,181,860
505 4,181,839

CLASS 251

133 4,181,288

CLASS 252

8.5 C 4,181,617
32.5 4,181,619
51.5 A 4,181,618
102 4,181,621
143 4,181,622
4,181,623
182 4,181,624
299 4,181,625
300 4,181,626
301.6 R 4,181,627
435 4,181,628
458 4,181,629
476 4,181,630
522 4,181,631
525 4,181,633
542 4,181,632
545 4,181,634

CLASS 254

107 4,181,289
124 4,181,290
184 4,181,291

CLASS 256

23 4,181,292
67 4,181,293

CLASS 260

5 4,181,635
8 4,181,636
16 4,181,637
22 R 4,181,638
29.6 WB 4,181,639
30.4 R 4,181,640
33.2 R 4,181,641
37 EP 4,181,642
40 R 4,181,643
42.18 4,181,644
42.28 4,181,645
42.48 4,181,581
45.7 P 4,181,646
45.75 N 4,181,648
112.5 R 4,181,649
112.7 4,181,650
119 4,181,651
124 R 4,181,652
207 4,181,653
239 BC 4,181,654
239 D 4,181,655
239.1 4,181,656
326.25 4,181,663
326.5 FN 4,181,662
340.5 R 4,181,665
347.8 4,181,666
347.9 4,181,667
377 4,181,668
397.4 4,181,669
410.5 4,181,670
410.6 4,181,671
429 J 4,181,672
448.2 T 4,181,673
448.8 R 4,181,674
449.5 4,181,675
463 4,181,676
465 F 4,181,677
544 F 4,181,678
4,181,679
563 D 4,181,680
575 4,181,681
584 B 4,181,682
593 R 4,181,683

CLASS 261

29 4,181,690
111 4,181,691
4,181,692
4,181,693

CLASS 264

41 4,181,694
45.9 4,181,647
150 4,181,695
166 4,181,696
176 F 4,181,697
249 4,181,698

CLASS 266

194 4,181,294

CLASS 269

3 4,181,295
88 4,181,296
328 4,181,297

CLASS 271

5 4,181,298

CLASS 272

86 4,181,299

CLASS 273

33 4,181,300
73 C 4,181,301
95 R 4,181,302
106.5 B 4,181,303
146 4,181,304
153 S 4,181,305
173 4,181,306
183 A 4,181,307
186 A 4,181,310
186 R 4,181,309
206 4,181,311
237 4,181,308

CLASS 277

133 4,181,312
166 4,181,313
205 4,181,314

CLASS 280

5 A 4,181,315
11.2 4,181,227
4,181,316
42 4,181,317
94 4,181,318
221 4,181,319
507 4,181,320
605 4,181,321
699 4,181,322
711 4,181,323
713 4,181,324
739 4,181,325
806 4,181,326

CLASS 281

25 R 4,181,327

CLASS 282

27.5 4,181,328

CLASS 285

3 4,181,329
127 4,181,330
141 4,181,331
334.4 4,181,332

CLASS 290

40 R 4,181,840

CLASS 292

66 4,181,333
87 4,181,334
92 4,181,335
262 4,181,336
271 4,181,337
341.17 4,181,338
347 4,181,339

CLASS 294

65.5 4,181,340
67 R 4,181,341
75 4,181,342
86 R 4,181,343
86.18 4,181,344
103 R 4,181,345

CLASS 296

1 R 4,181,347
1 S 4,181,346
39 R 4,181,349
95 C 4,181,350
100 4,181,351
165 4,181,348

CLASS 297

3 4,181,352
307 4,181,353
4,181,354
4,181,355
350 4,181,356
353 4,181,357
467 4,181,358
468 4,181,359

CLASS 299

1 4,181,360
2 4,181,361
4,181,362
17 4,181,363

CLASS 301

8 4,181,364
67 4,181,365

CLASS 303

3 4,181,366
7 4,181,367
15 4,181,368
16 4,181,369
24 F 4,181,370
50 4,181,371
115 4,181,372
116 4,181,373

CLASS 307

30 4,181,841
66 4,181,842
116 4,181,843
157 4,181,844
221 C 4,181,861
225 C 4,181,862
311 4,181,863
361 4,181,865

CLASS 308

6 C 4,181,374
4,181,375
6 R 4,181,376
8.2 4,181,377
36.1 4,181,378
187 4,181,379
233 4,181,380

CLASS 310

154 4,181,866
156 4,181,867
166 4,181,868
314 4,181,864

CLASS 312

183 4,181,381
245 4,181,382
334 4,181,383

CLASS 313

315 4,181,869
414 4,181,870
422 4,181,871

CLASS 315

106 4,181,872
291 4,181,873
370 4,181,874

CLASS 318

252 4,181,875
345 G 4,181,876
345 R 4,181,877

CLASS 323

94 R 4,181,878

CLASS 324

57 R 4,181,881
71 R 4,181,882
166 4,181,883
208 4,181,884
326 4,181,879
428 4,181,885
439 4,181,880

CLASS 325

4 4,181,886
15 4,181,887
42 4,181,888
124 4,181,889
316 4,181,890
464 4,181,891
474 4,181,892
492 4,181,893

CLASS 328

233 4,181,894

CLASS 330

279 4,181,895
282 4,181,896

CLASS 331

94.5 C 4,181,899
94.5 G 4,181,897
94.5 P 4,181,900
94.5 S 4,181,898
4,181,901
107 S 4,181,902

CLASS 333

81 R 4,181,903
153 4,181,904
255 4,181,905

CLASS 335

6 4,181,906
170 4,181,907
210 4,181,908

CLASS 339

14 R 4,181,384
17 C 4,181,385
4,181,387
21 R 4,181,388
32 M 4,181,389
65 4,181,390
92 M 4,181,391
95 R 4,181,392
98 4,181,393
103 R 4,181,394
176 MF 4,181,395
263 R 4,181,396

CLASS 340

147 SY 4,181,909

CLASS 343

18 E 4,181,910
225 4,181,911

CLASS 346

154 4,181,912

CLASS 350

96.10 4,181,398
96.14 4,181,399
96.20 4,181,397
96.21 4,181,400
4,181,401
4,181,402
96.33 4,181,403
125 4,181,404
331 4,181,405
357 4,181,406

CLASS 351

6 4,181,407
159 4,181,408
167 4,181,409

CLASS 352

91 R 4,181,410

CLASS 354

23 R 4,181,412
24 4,181,413
53 4,181,411
83 4,181,414
86 4,181,415
106 4,181,416
152 4,181,417
277 4,181,418
286 4,181,419
299 4,181,420
321 4,181,421

CLASS 355

3 DD 4,181,422
4 4,181,423
8 4,181,424
15 4,181,425
16 4,181,426
43 4,181,427
75 4,181,428
77 4,181,429

CLASS 356

1 4,181,430
5 4,181,431
28 4,181,432
73.1 4,181,433
137 4,181,434
141 4,181,435
225 4,181,436
246 4,181,437
312 4,181,438
338 4,181,439
346 4,181,440
414 4,181,441

417 4,181,442

CLASS 357

2 4,181,913

CLASS 358

1 4,181,914
27 4,181,915
4,181,916
36 4,181,917
237 4,181,918

CLASS 359

17 F 4,181,386

CLASS 360

42 4,181,919
88 4,181,920

CLASS 361

56 4,181,921
115 4,181,922
293 4,181,923
353 4,181,924

CLASS 362

29 4,181,925
33 4,181,926
163 4,181,927
184 4,181,928
192 4,181,929
296 4,181,930

CLASS 363

4 4,181,931
68 4,181,932

CLASS 364

200 4,181,933
4,181,934
4,181,935
4,181,936
4,181,937
4,181,938
4,181,939
4,181,940
4,181,941
4,181,942
426 4,181,943
431 4,181,944
436 4,181,945
466 4,181,946
478 4,181,947
4,181,948
487 4,181,949
492 4,181,950
499 4,181,951
515 4,181,952
4,181,953
520 4,181,954
521 4,181,955
4,181,956
557 4,181,957
560 4,181,958
562 4,181,959
4,181,960
563 4,181,961
565 4,181,962
705 4,181,963
708 4,181,964
710 4,181,965
715 4,181,966
724 4,181,967
728 4,181,968
739 4,181,969
760 4,181,970
900 4,181,971
4,181,972
4,181,973
4,181,974
4,181,975
4,181,976

CLASS 365

4 4,181,977
8 4,181,978
20 4,181,979
45 4,181,980
181 4,181,981

CLASS 400

320 4,181,443
568 4,181,444
632.1 4,181,445

CLASS 401

9 4,181,446

CLASS 403

4 4,181,447

CLASS 404

27 4,181,448
87 4,181,449

CLASS 405

19 4,181,450
128 4,181,451
203 4,181,452
4,181,453
227 4,181,454
232 4,181,455

CLASS 407

38 4,181,456

CLASS 408

217 4,181,457

CLASS 409

88 4,181,063
265 4,181,458

CLASS 414

161 4,181,459
400 4,181,460
412 4,181,461
460 4,181,462
490 4,181,463
501 4,181,464
590 4,181,465

CLASS 415

204 4,181,466
207 4,181,467

CLASS 417

63 4,181,468
87 4,181,469
131 4,181,470
360 4,181,471
363 4,181,472
365 4,181,473
366 4,181,474
372 4,181,475
477 4,181,476
560 4,181,477

CLASS 418

51 4,181,478
61. B 4,181,479
102 4,181,480
253 4,181,481

CLASS 422

87 4,181,699
102 4,181,700
158 4,181,701
265 4,181,702

CLASS 423

167 4,181,703
230 4,181,704
235 4,181,705
237 4,181,706
386 4,181,707

CLASS 424

19 4,181,708
21 4,181,709
33 4,181,710
49 4,181,712
86 4,181,713
117 4,181,714
122 4,181,715
124 4,181,716
177 4,181,717
180 4,181,718
233 4,181,719
241 4,181,720
243 4,181,721
250 4,181,722
4,181,723
4,181,724
256 4,181,657
258 4,181,725
260 4,181,726
266 4,181,658
270 4,181,727
271 4,181,659
273 R 4,181,728
4,181,729
4,181,730
4,181,731
4,181,732
274 4,181,733
4,181,740
285 4,181,734
304 4,181,735
311 4,181,741
317 4,181,736
319 4,181,737
330 4,181,738

CLASS 425

28 R 4,181,482
36 4,181,483
59 4,181,484
88 4,181,485
113 4,181,486
326.1 4,181,487
577 4,181,488

CLASS 426

12 4,181,742
233 4,181,744
241 4,181,743
250 4,181,745
272 4,181,739
335 4,181,746
615 4,181,747
623 4,181,748
643 4,181,749

CLASS 427

53.1 4,181,751
54.1 4,181,752
64 4,181,753
74 4,181,754
163 4,181,756
229 4,181,757
253 4,181,758
304 4,181,759
305 4,181,760

CLASS 428

31 4,181,761
40 4,181,711
97 4,181,762
142 4,181,763
155 4,181,764
157 4,181,765
216 4,181,766
219 4,181,767
252 4,181,768
253 4,181,769
260 4,181,770
327 4,181,771
329 4,181,773
335 4,181,774
348 4,181,775
474 4,181,528

CLASS 429

27 4,181,776
50 4,181,777
53 4,181,778
199 4,181,779

CLASS 430

58 4,181,772
67 4,181,526
114 4,181,620
270 4,181,531
314 4,181,755
414 4,181,750
543 4,181,527
620 4,181,530
626 4,181,529

CLASS 431

11 4,181,489
129 4,181,490
187 4,181,491
264 4,181,492
344 4,181,493

CLASS 432

2 4,181,494
118 4,181,495
137 4,181,496

CLASS 433

9 4,180,911
13 4,180,912
173 4,180,910
228 4,180,913

CLASS 435

11 4,181,575
77 4,181,574
119 4,181,573
247 4,181,576

CLASS 521

93 4,181,780
137 4,181,781
162 4,181,782

CLASS 525

100 4,181,687
161 4,181,783
4,181,784
4,181,785
327 4,181,786
390 4,181,688
402 4,181,685
419 4,181,689
474 4,181,686

CLASS 526

62 4,181,787
68 4,181,788
143 4,181,790

CLASS 528

73 4,181,789
179 4,181,791
190 4,181,792
327 4,181,793
496 4,181,794

CLASS 536

1 4,181,796
4 4,181,795
10 4,181,797

CLASS 542

426 4,181,798

CLASS 544

48 4,181,799
180 4,181,800
192 4,181,801

CLASS 546

199 4,181,802
237 4,181,803

CLASS 548

110 4,181,660
195 4,181,661
311 4,181,804
328 4,181,805

CLASS 549

6 4,181,806
60 4,181,664

CLASS 560

52 4,181,807
121 4,181,808

CLASS 568

671 4,181,809
807 4,181,810

CLASS 585

25 4,181,684
486 4,181,811

CLASSIFICATION OF DESIGNS

D2— 321 253,796
253,797
400 253,798
D3— 38 253,855
D6— 24 253,800
63 253,801
D7— 71 253,802
105 253,803
107 253,804
189 253,805
D8— 1 253,806
11 253,807
371 253,808
D9— 61 253,809
224 253,810
D10— 85 253,811
97 253,812
D11— 99 253,813
132 253,814
D12— 12 253,815
155 253,816
205 253,817
D14— 10 253,818
35 253,819
43 253,820
60 253,821
70 253,822
96 253,823
D15— 3 253,824
12 253,825
37 253,826
48 253,827
130 253,828
D16— 1 253,829
D18— 9 253,830
D19— 25 253,831
D2i— 80 253,832
88 253,833
89 253,834
158 253,835
166 253,836
D22— 25 253,837
253,838
253,839
253,840
D23— 3 253,841
25 253,799
35 253,842
38 253,843
139 253,844
147 253,845
253,846
D25— 23 253,847
D27— 3 253,848
D28— 24 253,849
25 253,850
59 253,851
D30— 38 253,852
D48— 23 R 253,853
253,854

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

222— 323 T990,002
383 T990,003
260— 559 R T990,004
426— 239 T990,005
428— 131 T990,006
429— 158 T990,007
430— 162 T990,001

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,181,843
2 : 4,181,339
6 : 4,180,915
4,180,938
4,180,941
4,180,945
4,181,062
4,181,130
4,181,152
4,181,188
4,181,214
4,181,277
4,181,279
4,181,319
4,181,324
4,181,326
4,181,351
4,181,392
4,181,394
4,181,401
4,181,402
4,181,493
4,181,519
4,181,555
4,181,654
4,181,748
4,181,817
4,181,835
4,181,879
4,181,911
4,181,920
4,181,927
4,181,931
4,181,935
4,181,952
4,181,972
8 : 4,180,963
4,181,118
4,181,962
4,181,966
9 : 4,181,503
4,181,728
4,181,729
4,181,758
01 : 4,181,500
02 : 4,181,448
04 : 4,180,875
4,180,893
4,181,509
4,181,765
4,181,813
4,181,941
4,181,967

05 : 4,181,230
06 : 4,180,924
4,180,928
4,180,934
4,180,943
4,180,958
4,180,980
4,181,000
4,181,014
4,181,027
4,181,028
4,181,029
4,181,048
4,181,094
4,181,126
4,181,129
4,181,139
4,181,143
4,181,151
4,181,156
4,181,177
4,181,231
4,181,235
4,181,243
4,181,249
4,181,281
4,181,283
4,181,290
4,181,304
4,181,306
4,181,307
4,181,310
4,181,311
4,181,314
4,181,318
4,181,364
4,181,367
4,181,377
4,181,391
4,181,407
4,181,423
4,181,440
4,181,545
4,181,549
4,181,560
4,181,596
4,181,599
4,181,638
4,181,662
4,181,692
4,181,693
4,181,700
4,181,702

4,181,705
4,181,720
4,181,751
4,181,764
4,181,774
4,181,814
4,181,822
4,181,827
4,181,846
4,181,853
4,181,855
4,181,892
4,181,900
4,181,910
4,181,913
4,181,934
4,181,942
4,181,953
4,181,954
4,181,980
08 : 4,181,224
4,181,361
4,181,362
4,181,463
4,181,965
09 : 4,180,986
4,181,043
4,181,069
4,181,253
4,181,264
4,181,293
4,181,389
4,181,396
4,181,474
4,181,550
4,181,570
4,181,609
4,181,631
4,181,781
4,181,907
10 : 4,181,579
4,181,613
4,181,648
4,181,686
4,181,741
4,181,768
11 : 4,181,046
4,181,455
12 : 4,180,873
4,180,884
4,180,906
4,181,068
4,181,075

4,181,242
4,181,309
4,181,320
4,181,347
4,181,384
4,181,385
4,181,678
4,181,679
4,181,698
4,181,893
4,181,950
4,181,977
13 : 4,181,091
4,181,166
4,181,302
15 : 4,181,081
16 : 4,181,074
4,181,117
17 : 4,180,899
4,180,911
4,180,918
4,180,925
4,180,926
4,180,988
4,181,006
4,181,017
4,181,059
4,181,095
4,181,098
4,181,140
4,181,144
4,181,169
4,181,232
4,181,237
4,181,244
4,181,245
4,181,250
4,181,284
4,181,337
4,181,338
4,181,378
4,181,441
4,181,478
4,181,479
4,181,482
4,181,488
4,181,534
4,181,552
4,181,602
4,181,611
4,181,670
4,181,726
4,181,747

4,181,762
4,181,823
4,181,826
4,181,831
4,181,839
4,181,844
4,181,858
4,181,870
4,181,891
18 : 4,180,912
4,180,972
4,181,042
4,181,093
4,181,199
4,181,336
4,181,459
4,181,466
4,181,523
4,181,540
4,181,603
4,181,695
4,181,737
4,181,795
4,181,819
4,181,889
4,181,915
20 : 4,181,142
4,181,286
4,181,312
4,181,591
4,181,919
21 : 4,181,037
4,181,773
4,181,836
22 : 4,181,047
4,181,196
4,181,387
24 : 4,180,872
4,180,954
4,181,132
4,181,219
4,181,403
4,181,418
4,181,477
4,181,578
4,181,691
4,181,851
4,181,886
4,181,897
4,181,904
4,181,940
4,181,968
4,181,969

25 : 4,180,901
4,180,935
4,180,942
4,180,960
4,180,964
4,180,984
4,181,128
4,181,135
4,181,220
4,181,381
4,181,399
4,181,409
4,181,421
4,181,468
4,181,557
4,181,593
4,181,660
4,181,754
4,181,778
4,181,939
4,181,949
4,181,974
26 : 4,180,876
4,180,957
4,180,977
4,180,978
4,180,979
4,181,009
4,181,010
4,181,011
4,181,015
4,181,031
4,181,041
4,181,065
4,181,148
4,181,157
4,181,158
4,181,172
4,181,173
4,181,203
4,181,205
4,181,208
4,181,209
4,181,210
4,181,292
4,181,325
4,181,329
4,181,366
4,181,382
4,181,457
4,181,585
4,181,657
4,181,665

4,181,724
4,181,783
4,181,784
4,181,785
4,181,798
4,181,808
4,181,825
4,181,833
4,181,918
4,181,921
4,181,947
4,181,958
27 : 4,180,879
4,180,929
4,181,121
4,181,194
4,181,295
4,181,323
4,181,333
4,181,470
4,181,607
4,181,744
4,181,745
4,181,766
4,181,957
28 : 4,181,342
4,181,622
29 : 4,180,877
4,181,057
4,181,066
4,181,238
4,181,296
4,181,341
4,181,605
4,181,646
4,181,718
30 : 4,181,221
31 : 4,181,150
4,181,358
32 : 4,181,153
4,181,588
4,181,630
33 : 4,181,287
4,181,672
4,181,820
4,181,869
4,181,976
34 : 4,180,889
4,180,890
4,180,897
4,181,087
4,181,127
4,181,134
4,181,136
4,181,233
4,181,263
4,181,297
4,181,356

4,181,388
4,181,433
4,181,467
4,181,521
4,181,544
4,181,551
4,181,573
4,181,598
4,181,600
4,181,601
4,181,619
4,181,632
4,181,633
4,181,634
4,181,687
4,181,704
4,181,717
4,181,733
4,181,743
4,181,750
4,181,755
4,181,759
4,181,760
4,181,779
4,181,780
4,181,811
4,181,821
4,181,824
4,181,871
4,181,874
4,181,887
4,181,888
4,181,916
4,181,978
4,181,979
36 : 4,180,881
4,180,921
4,180,930
4,180,932
4,180,952
4,180,955
4,180,982
4,180,993
4,181,022
4,181,039
4,181,061
4,181,090
4,181,096
4,181,124
4,181,167
4,181,223
4,181,240
4,181,255
4,181,327
4,181,405
4,181,426
4,181,429
4,181,432

4,181,434
4,181,446
4,181,456
4,181,472
4,181,501
4,181,505
4,181,511
4,181,512
4,181,514
4,181,525
4,181,526
4,181,587
4,181,641
4,181,663
4,181,677
4,181,738
4,181,772
4,181,799
4,181,818
4,181,849
4,181,864
4,181,877
4,181,880
4,181,882
4,181,899
4,181,917
4,181,933
4,181,955
4,181,956
4,181,973
37 : 4,180,949
4,181,103
4,181,119
4,181,504
4,181,528
4,181,606
4,181,951
38 : 4,181,125
39 : 4,180,874
4,180,940
4,180,947
4,180,974
4,180,987
4,181,030
4,181,035
4,181,064
4,181,078
4,181,137
4,181,145
4,181,216
4,181,260
4,181,261
4,181,268
4,181,348
4,181,352
4,181,435
4,181,487
4,181,547

4,181,548
4,181,583
4,181,584
4,181,590
4,181,592
4,181,626
4,181,644
4,181,681
4,181,756
4,181,883
4,181,946
4,181,971
40 : 4,180,948
4,181,021
4,181,207
4,181,265
4,181,454
4,181,576
4,181,707
41 : 4,180,976
4,181,025
4,181,026
4,181,189
4,181,195
4,181,340
4,181,903
42 : 4,180,871
4,180,902
4,180,903
4,180,917
4,180,922
4,180,961
4,181,008
4,181,018
4,181,020
4,181,024
4,181,056
4,181,060
4,181,099
4,181,133
4,181,154
4,181,215
4,181,229
4,181,278
4,181,282
4,181,294
4,181,335
4,181,369
4,181,386
4,181,393
4,181,449
4,181,460
4,181,471
4,181,480
4,181,491
4,181,497
4,181,524
4,181,564

4,181,572
4,181,594
4,181,597
4,181,650
4,181,661
4,181,680
4,181,713
4,181,727
4,181,763
4,181,769
4,181,804
4,181,837
4,181,840
4,181,842
4,181,885
4,181,906
4,181,922
4,181,928
44 : 4,180,885
4,181,234
45 : 4,180,869
4,181,274
4,181,929
47 : 4,181,085
4,181,106
4,181,165
4,181,170
4,181,246
4,181,349
4,181,538
4,181,553
4,181,640
4,181,653
4,181,708
4,181,709
4,181,710
4,181,792
4,181,793
4,181,806
48 : 4,180,867
4,180,878
4,180,896
4,180,927
4,180,937
4,180,985
4,181,073
4,181,149
4,181,175
4,181,176
4,181,178
4,181,179
4,181,184
4,181,185
4,181,186
4,181,259
4,181,288
4,181,299
4,181,308

4,181,331
4,181,344
4,181,492
4,181,533
4,181,536
4,181,566
4,181,586
4,181,617
4,181,675
4,181,682
4,181,794
4,181,809
4,181,845
4,181,873
4,181,943
4,181,948
4,181,964
4,181,975
49 : 4,180,868
4,181,070
4,181,546
4,181,554
4,181,909
50 : 4,181,248
4,181,981
51 : 4,180,907
4,181,050
4,181,071
4,181,123
4,181,247
4,181,451
4,181,559
4,181,924
53 : 4,180,936
4,180,971
4,181,516
4,181,612
4,181,881
4,181,898
54 : 4,181,734
55 : 4,180,931
4,180,944
4,180,962
4,180,965
4,180,996
4,180,997
4,181,004
4,181,201
4,181,206
4,181,227
4,181,300
4,181,357
4,181,462
4,181,627
4,181,652
4,181,771
4,181,829
4,181,902

DESIGN PATENTS

05 : 253,819
06 : 253,802
253,816
253,817
253,827
253,848
253,850
253,853

08 : 253,828
09 : 253,807
253,820
253,851
12 : 253,806
13 : 253,835
16 : 253,798
17 : 253,800

253,812
253,849
18 : 253,841
20 : 253,842
22 : 253,813
253,836
24 : 253,844
25 : 253,796

253,797
26 : 253,814
253,815
27 : 253,810
253,818
253,843
29 : 253,825
32 : 253,847

34 : 253,799
253,821
36 : 253,854
37 : 253,801
253,805
253,834
39 : 253,833

42 : 253,832
44 : 253,809
45 : 253,831
48 : 253,855
51 : 253,808
253,845
253,846

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

25 : T990,005
26 : T990,002
T990,003
36 : T990,004
T990,007
45 : T990,006

U.S. GOVERNMENT PRINTING OFFICE : O - 1979

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges Jr., *Acting Secretary*

PATENT AND TRADEMARK OFFICE
Sidney A. Diamond, *Commissioner*